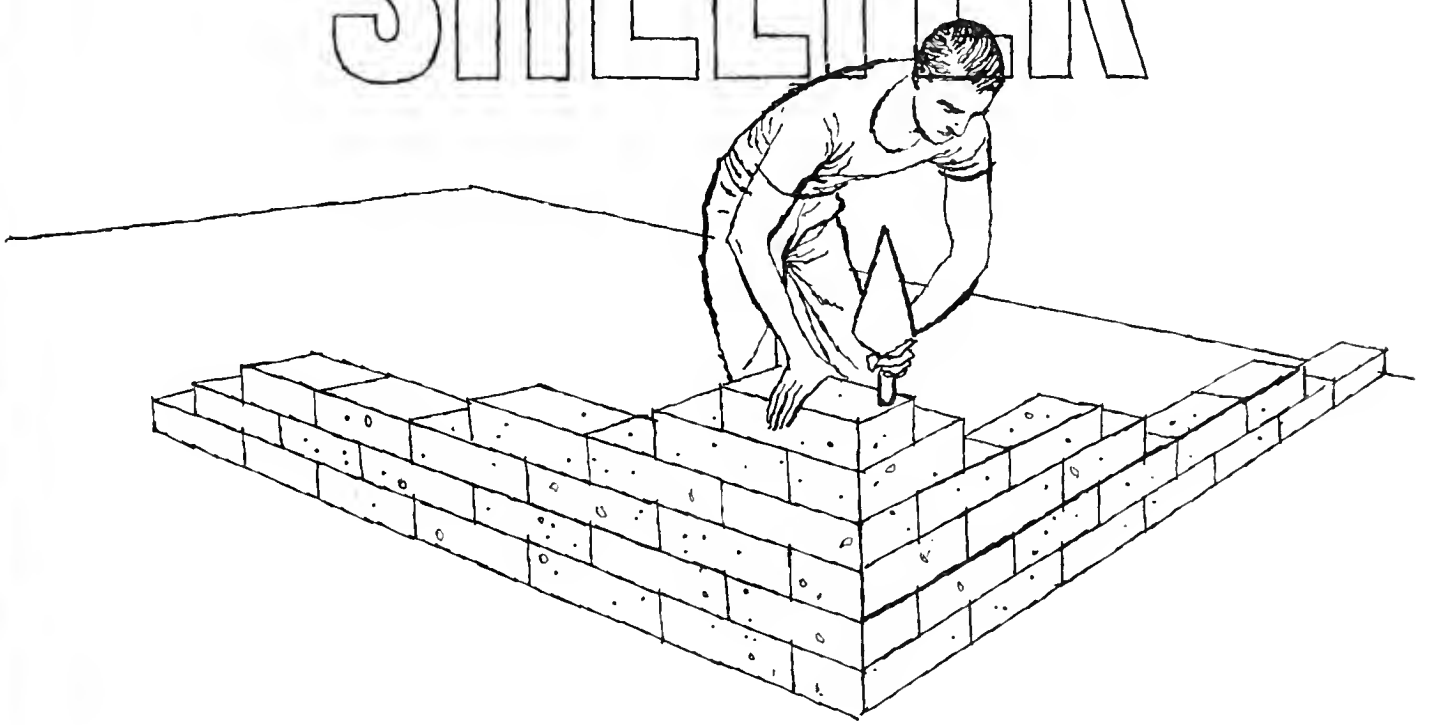
THE FAMILY FALLOUT SHELTER



MP–15

A committee of the National Academy of Sciences, in a recent study of national preparedness, concluded:

> *"Adequate shielding is the only effective means of preventing radiation casualties."*

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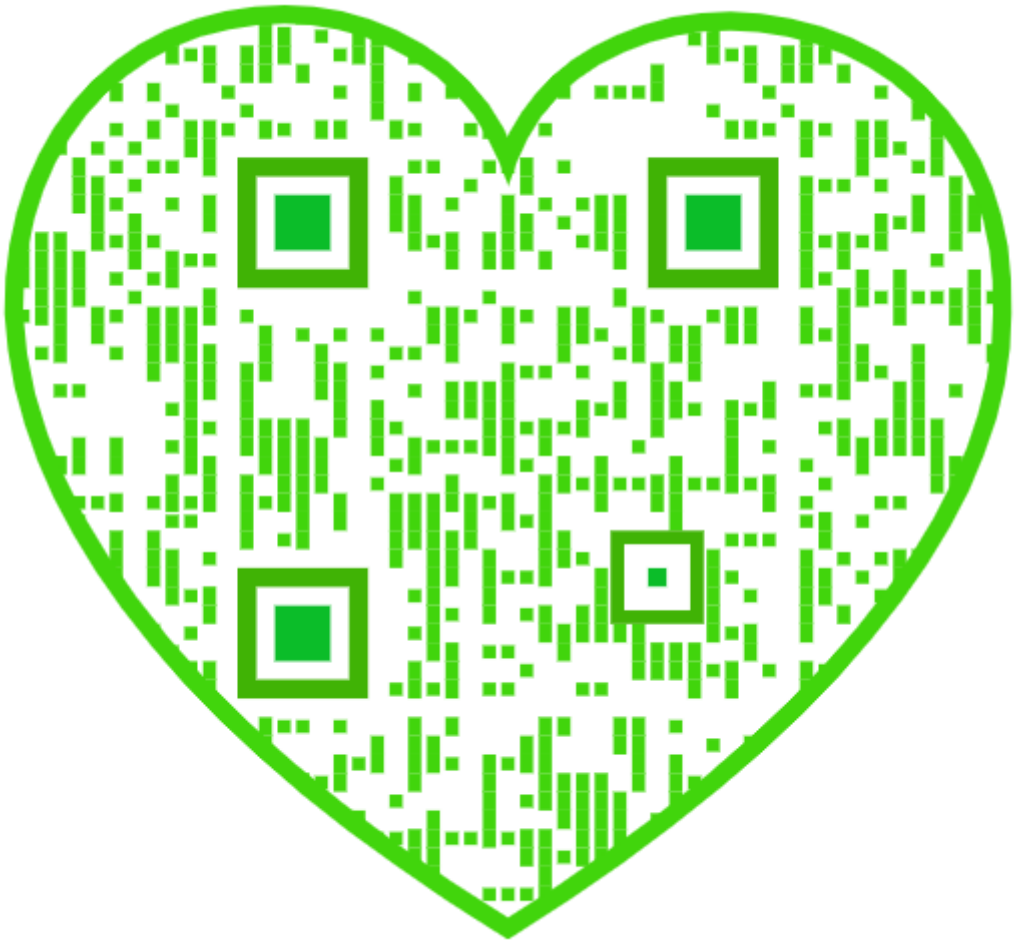


INTRODUCTION

Let us take a hard look at the facts.

In an atomic war, blast, heat, and initial radiation could kill millions close to ground zero of nuclear bursts.

Many *more* millions—everybody else—could be threatened by radioactive fallout. But most of these could be saved.

The purpose of this booklet is to show how to escape death from fallout.

Everyone, even those far from a likely target, would need shelter from fallout.

Your Federal Government has a shelter policy based on the knowledge that most of those beyond the range of blast and heat will survive if they have adequate protection from fallout.

This booklet contains building plans for five basic fallout shelters. One of the five—the Basement Concrete Block Shelter—has been designed specifically as a do-it-yourself project. Solid concrete blocks are used to build it. Most people probably would need the assistance of a contractor to build any of the other four types.

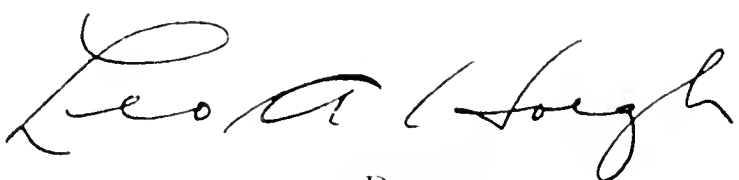
The least expensive shelter described is the Basement Concrete Block Shelter. The most expensive is the Underground Concrete Shelter.

Savings usually can be realized if a shelter is constructed at the time a house is being built.

Each of the shelters incorporates the fundamentals for fallout protection—shielding mass, ventilation, space to live. Each can serve a dual purpose—protection from tornadoes and other severe storms in addition to protection from the fallout radiation of a nuclear bomb.

There *are* means of protection.

But that protection must be provided before, not after, the sirens sound.



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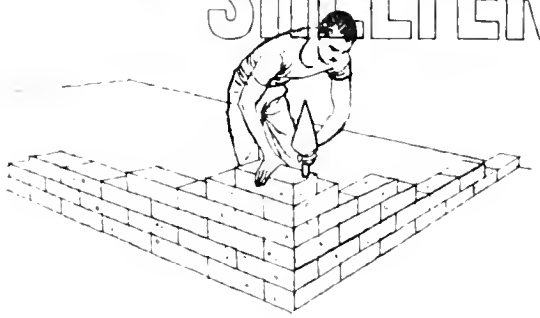
THE FAMILY FALLOUT SHELTER



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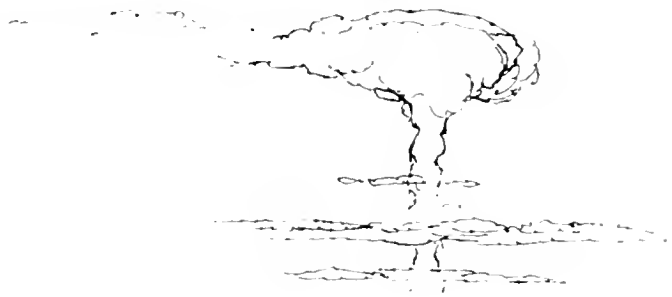
JUNE 1959



I. Fallout Shelter Is Needed Everywhere

One thing is certain if this country is attacked with nuclear weapons our air and missile bases will be primary targets.

The enemy would try to knock out our retaliatory power.

He might also try to destroy our cities.

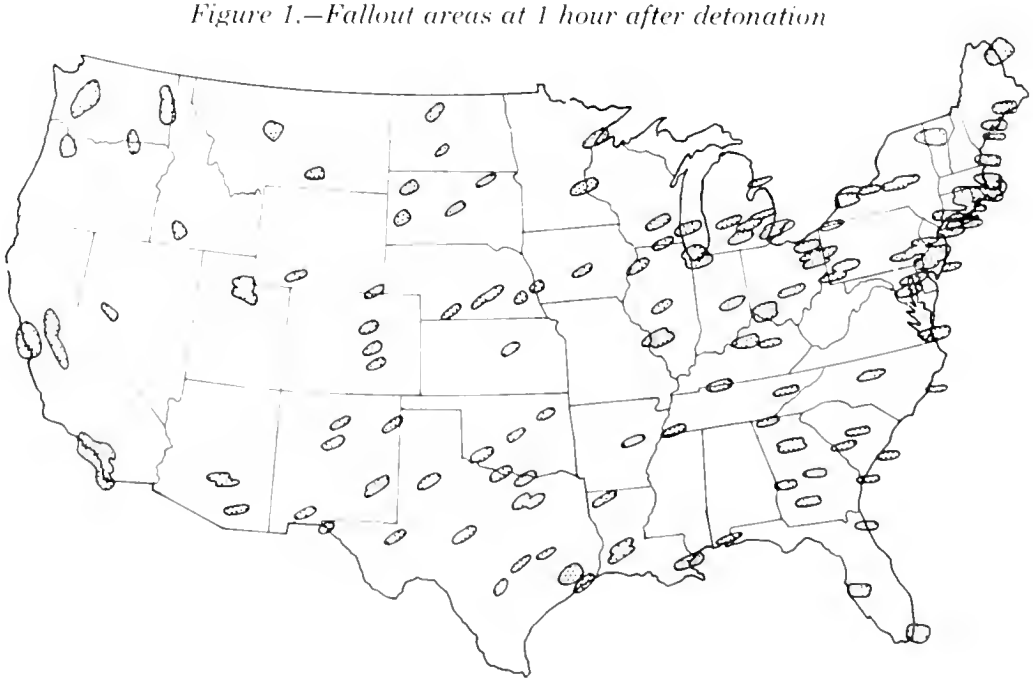
No one can be sure now how far the enemy will go.

But it must be emphasized that even if an enemy confines his attack to our retaliatory bases, the radioactive fallout from his nuclear bombs would threaten life in the entire country. An atomic burst on the ground sends up a mushroom cloud from which radioactive dust will fall hundreds of miles away.

Fallout from one test explosion spread over 7,000 square miles of the Pacific Ocean.

The following maps show the spread of fallout after a large assumed attack on military and civilian targets. Hour by hour the fallout spreads and overlaps until, after 24 hours, it almost completely covers the Nation. (See figs. 1 and 2.)

Figure 1.—Fallout areas at 1 hour after detonation



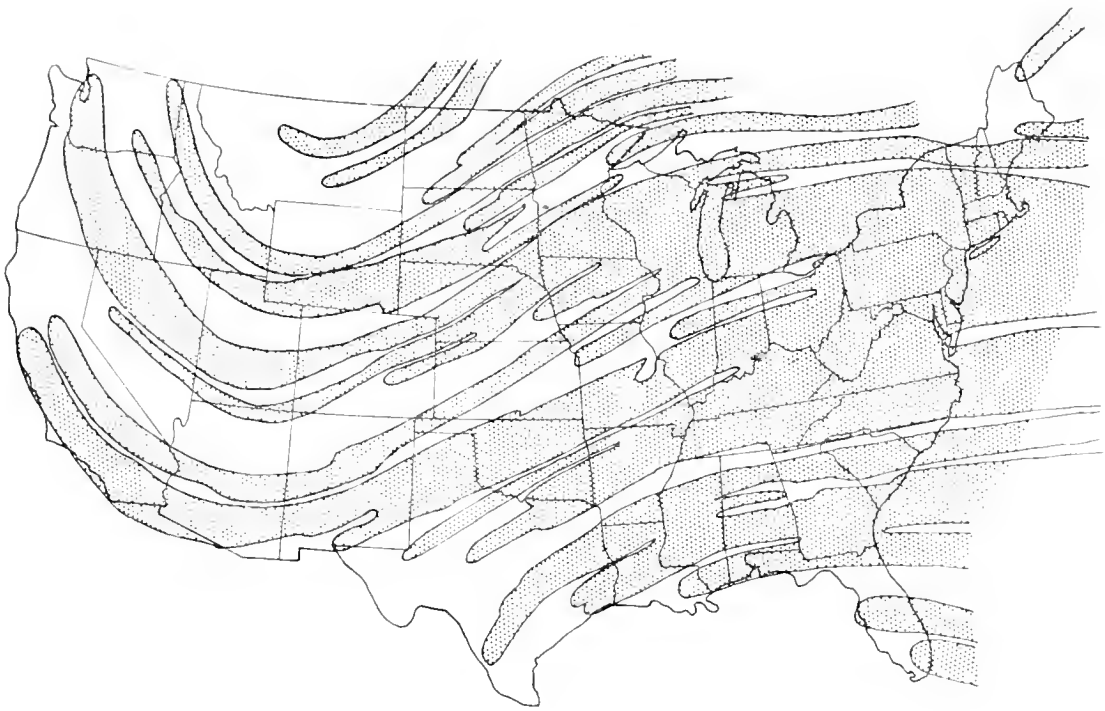
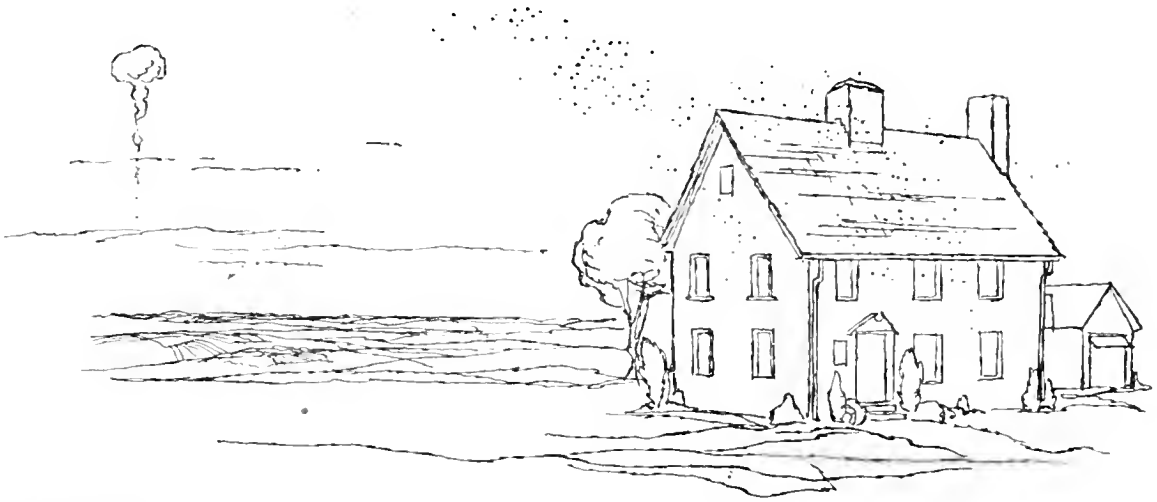


Figure 2.—Fallout areas at 24 hours after detonation

These maps show where the wind would have carried the fallout from the assumed attack on a given day. On another day, the wind could swing in any other direction and turn safe areas on these maps into areas of extreme fallout danger.

The fallout radiation threat indicated on the map is not uniform. The danger diminishes as the fallout drifts further from the points of nuclear explosion. But even on the extreme limits of the drift the fallout remains a menace to life and health for some time.

The lesson is: fallout shelter is needed everywhere.



II. The Shelters

YOU CAN PROTECT YOURSELF FROM FALLOUT RADIATION.

Any mass of material between you and the fallout will cut down the amount of radiation that reaches you. Sufficient mass will make you safe.

Concrete or bricks, earth or sand, are some of the materials heavy enough to afford protection by absorbing radiation. There is about the same amount of shielding in 8 inches of concrete, for instance, as in 12 inches of earth, 16 inches of books or 30 inches of wood. In most of the country, everywhere except in areas hit by the heaviest fallout, these thicknesses would give ample protection for a basement shelter.

The shelters suggested here have concrete and earth for shielding. You can build some of these shelters yourself. Others would require contractors. Some of the shelters are for basements, some for outdoors. For family shelters 10 square feet per person is adequate. (12½ square feet per person is recommended for mass shelters.)

BASEMENT CONCRETE BLOCK SHELTER

Basement shelters generally are the least expensive type that will give substantial protection. A basement shelter can be built with solid concrete blocks as a do-it-yourself project. The price of materials varies in different parts of the country. In May of 1959 sample bids showed a price range of between $150 and $200. This shelter would provide all the protection needed in most of the Nation. That means it would save many lives even in the areas of heaviest fallout, and most lives everywhere else.

This type of inexpensive basement shelter also can be incorporated in plans for new home construction. Other types of effective shelters can be built in new homes with relatively minor changes in design. (See Fig. 20.)

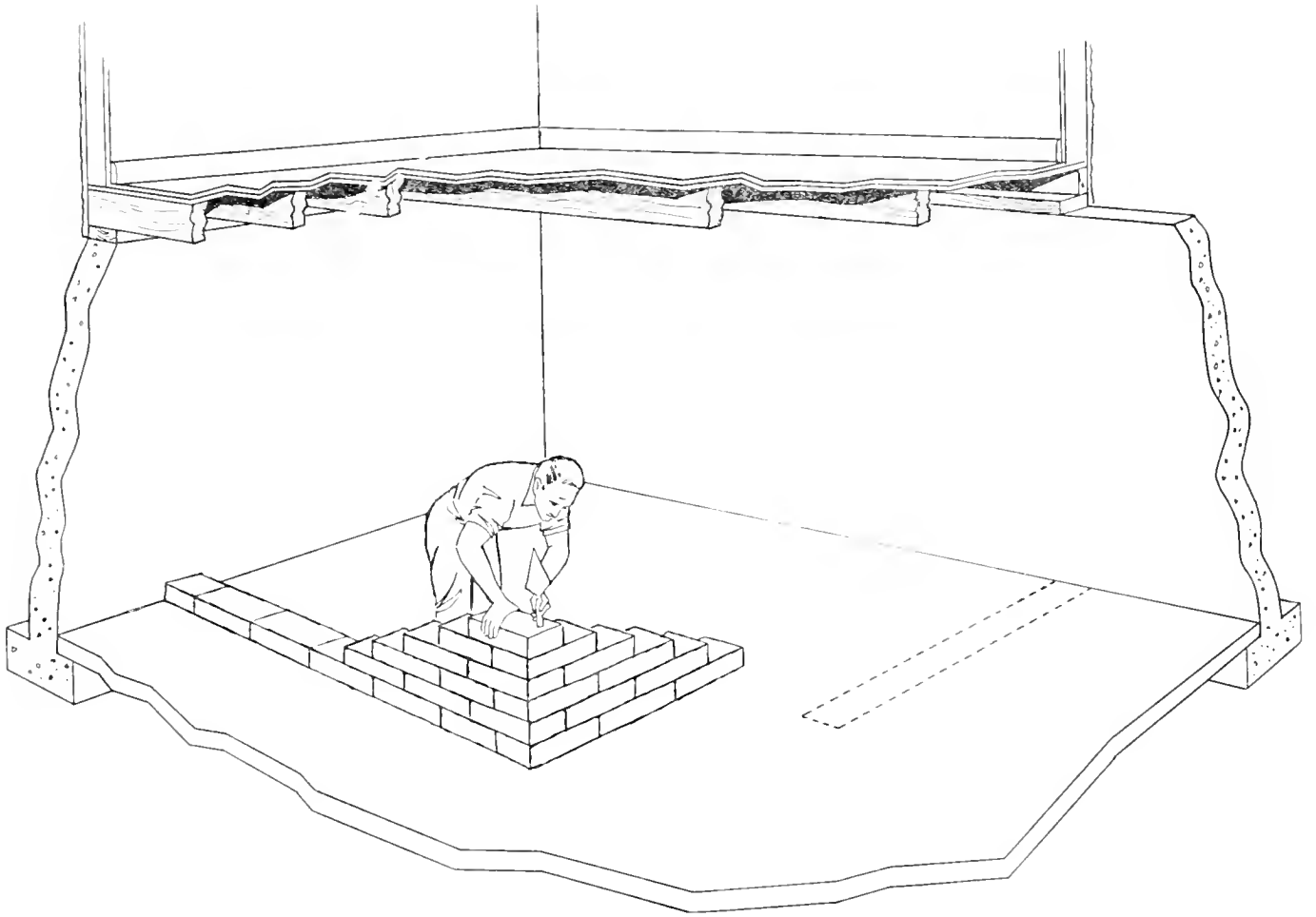


Figure 3

A row of solid concrete blocks is set in about three-eighths of an inch of wet mortar along guidelines marked on the basement floor. The corner is built about six blocks high (fig. 3). The remainder of the wall then is raised to the same height. The corner is built up once more and the wall again raised to its level. The wall is not raised all the way to the basement ceiling. Clear space of at least 16 inches is needed overhead to permit the later construction of the shelter roof. The top rows of concrete blocks are not set on the wall until after the roof is in place.

Ventilation is provided by an open doorway and vents near the floor in one wall. The four vents are simply small gaps in one layer of blocks.

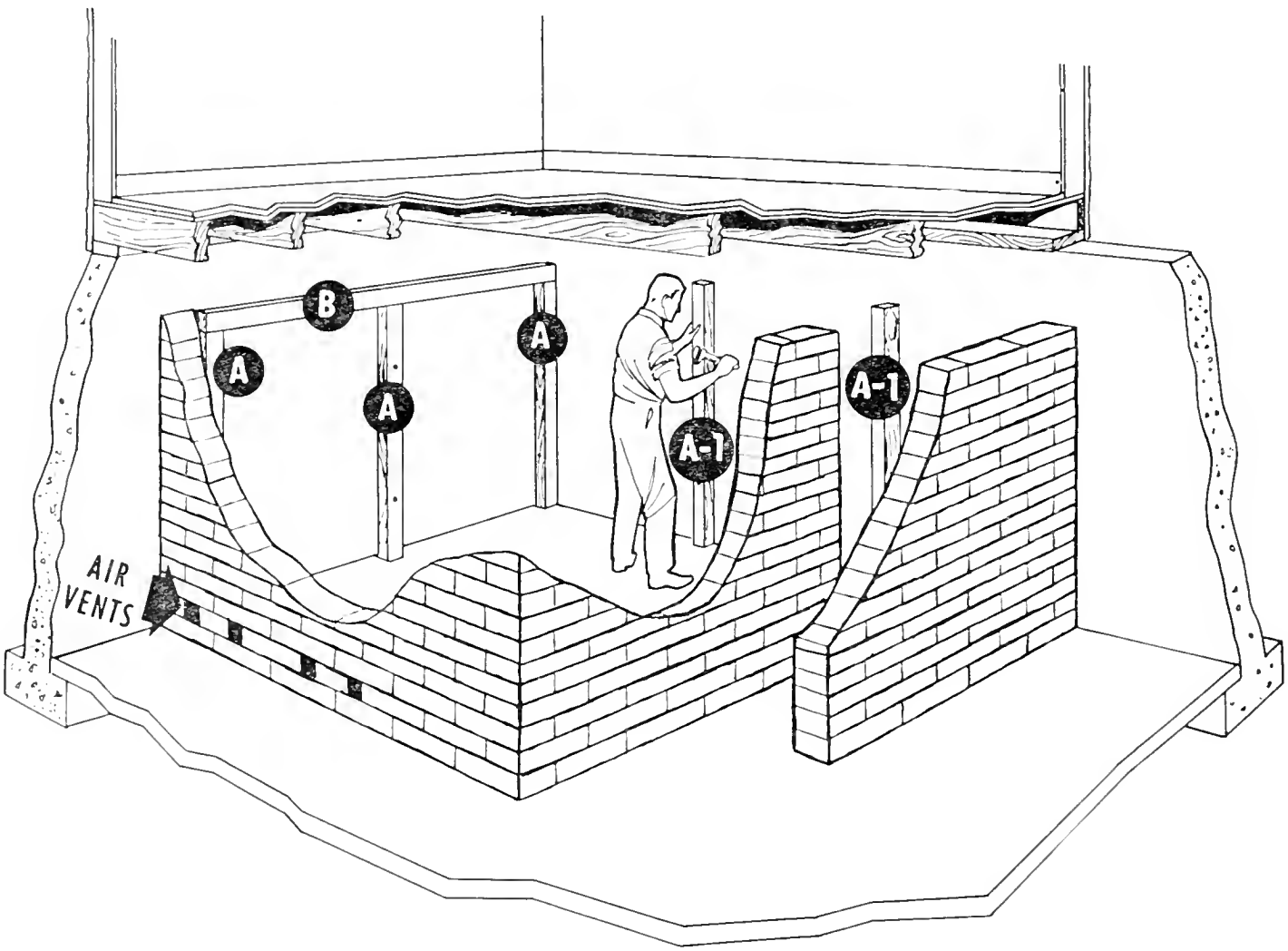


Figure 4

The wall protecting the shelter entrance from direct radiation should be the same height as the main shelter walls. The posts (marked "A" and "A–1" in fig. 4) that support the roof beams are fixed to the basement walls with ½-inch anchor bolts. The height of the posts marked "A–1" should equal the height of post "A" plus the thickness of beam "B." A wall beam (marked "B" in fig. 4) is put in place against the rear wall from one corner post to the other. The beam should be nailed to the uprights on which it rests.

The roof beams (marked "C" in fig. 5) are installed after the mortar in the block wall has dried at least a day. One end of each roof beam is nailed to the wall beam (marked "B" in fig. 5). The roof beams are placed on edge. Wood braces (marked "D" in fig. 5) hold them in place.

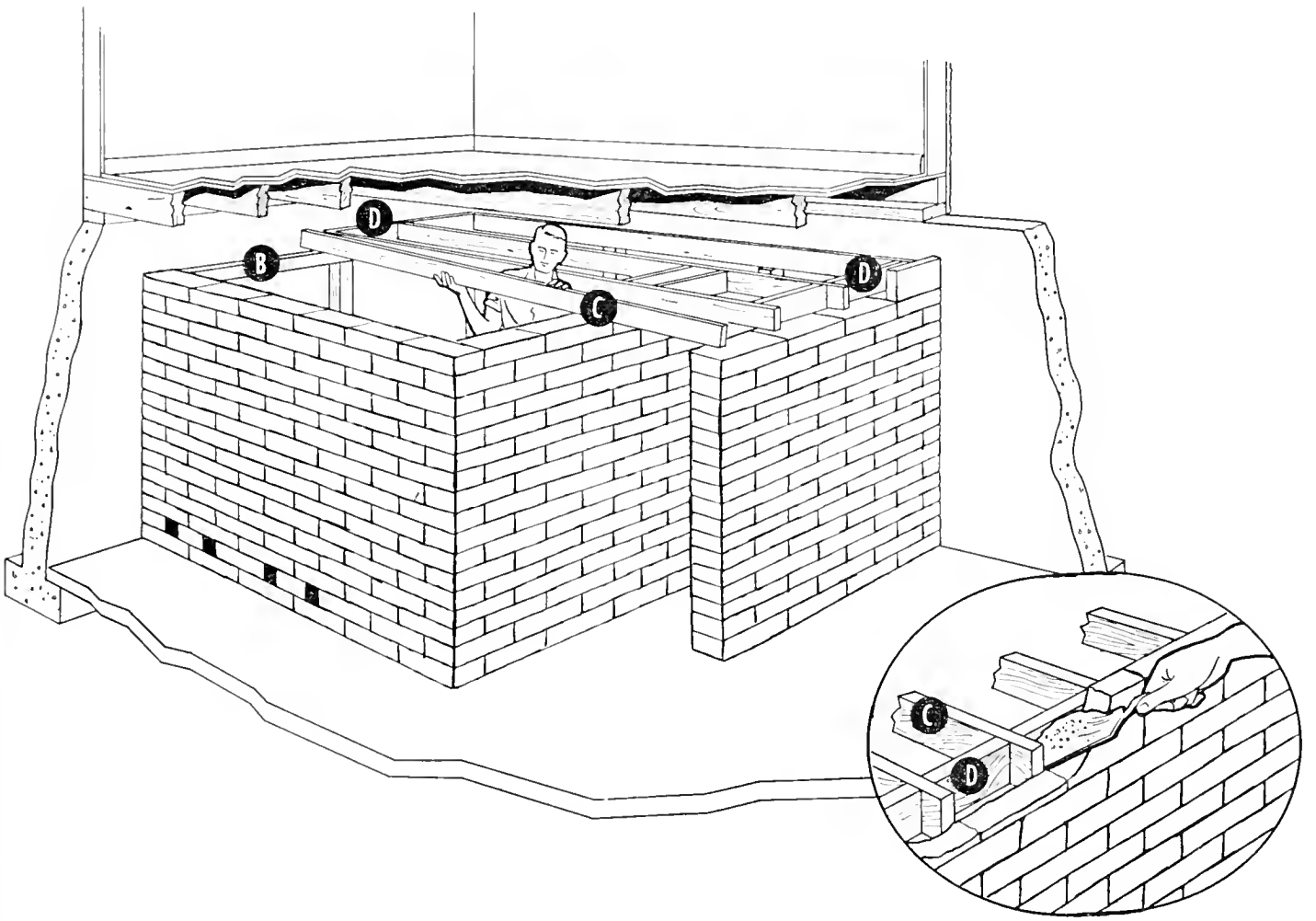


Figure 5

At the entrance side of the shelter, each roof beam is rested on the inside 4 inches of the block wall. The outside 4-inch space is filled by mortaring blocks on edge. The wooden bracing between the roof beams is placed flush with the inside of the wall. Mortar is poured between this bracing and the 4-inch blocks on edge to complete the wall thickness for radiation shielding. (For details see inset, fig. 5.)

The first one or two roof boards (marked "E" in fig. 6) are slipped into place across the roof beams, from outside the shelter. These boards are nailed to the roof beams by reaching up through the open space between the beams, from inside the shelter. Concrete blocks are passed between the beams and put on the boards. The roof blocks are in two layers and are not mortared together.

Work on the roof continues in this way. The last roof boards are covered with blocks from outside the shelter.

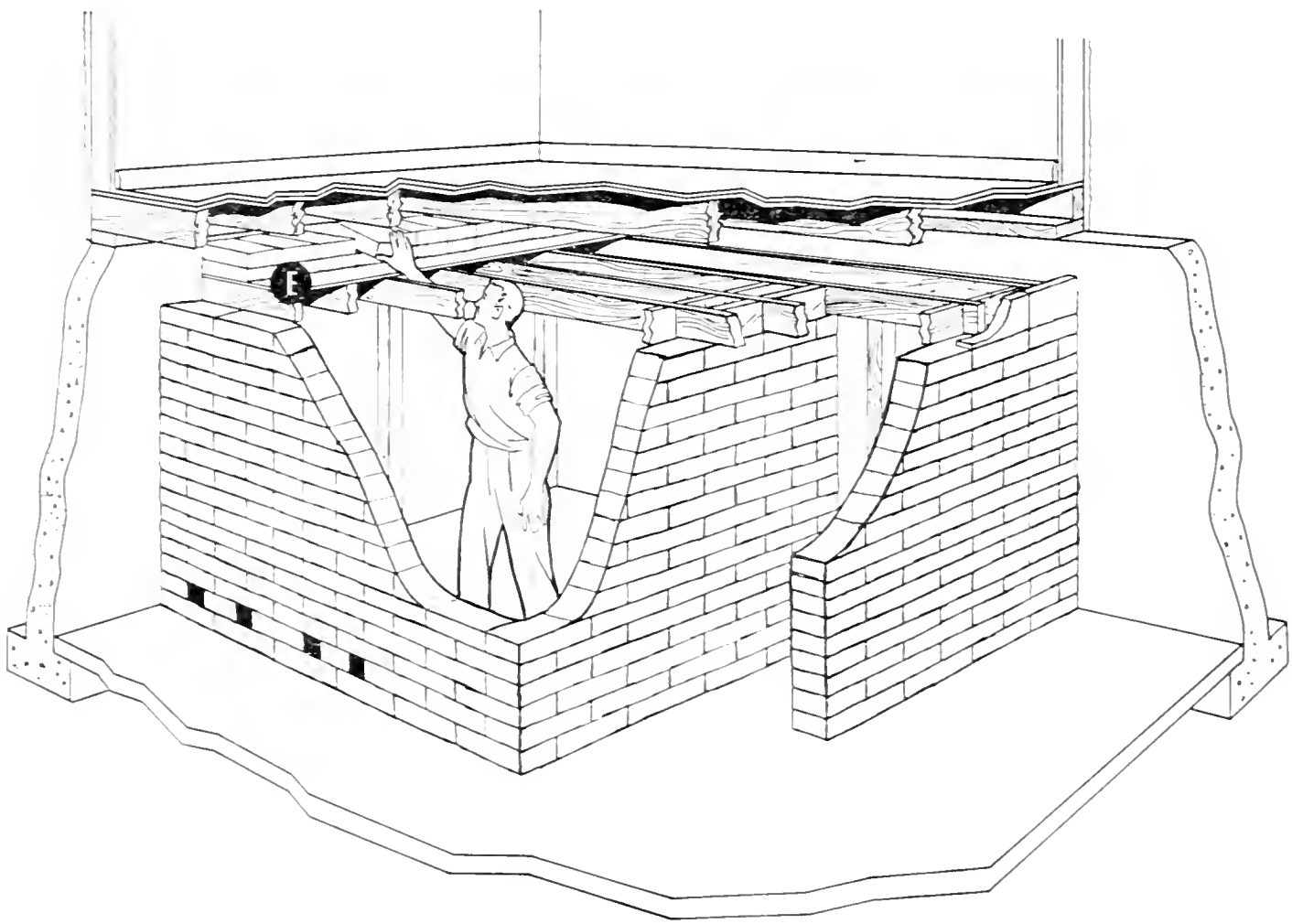


Figure 6

When the roof blocks are all in place, the final rows of wall blocks are mortared into position. The structure is complete. (See fig. 7.) Building plans are on page 21.

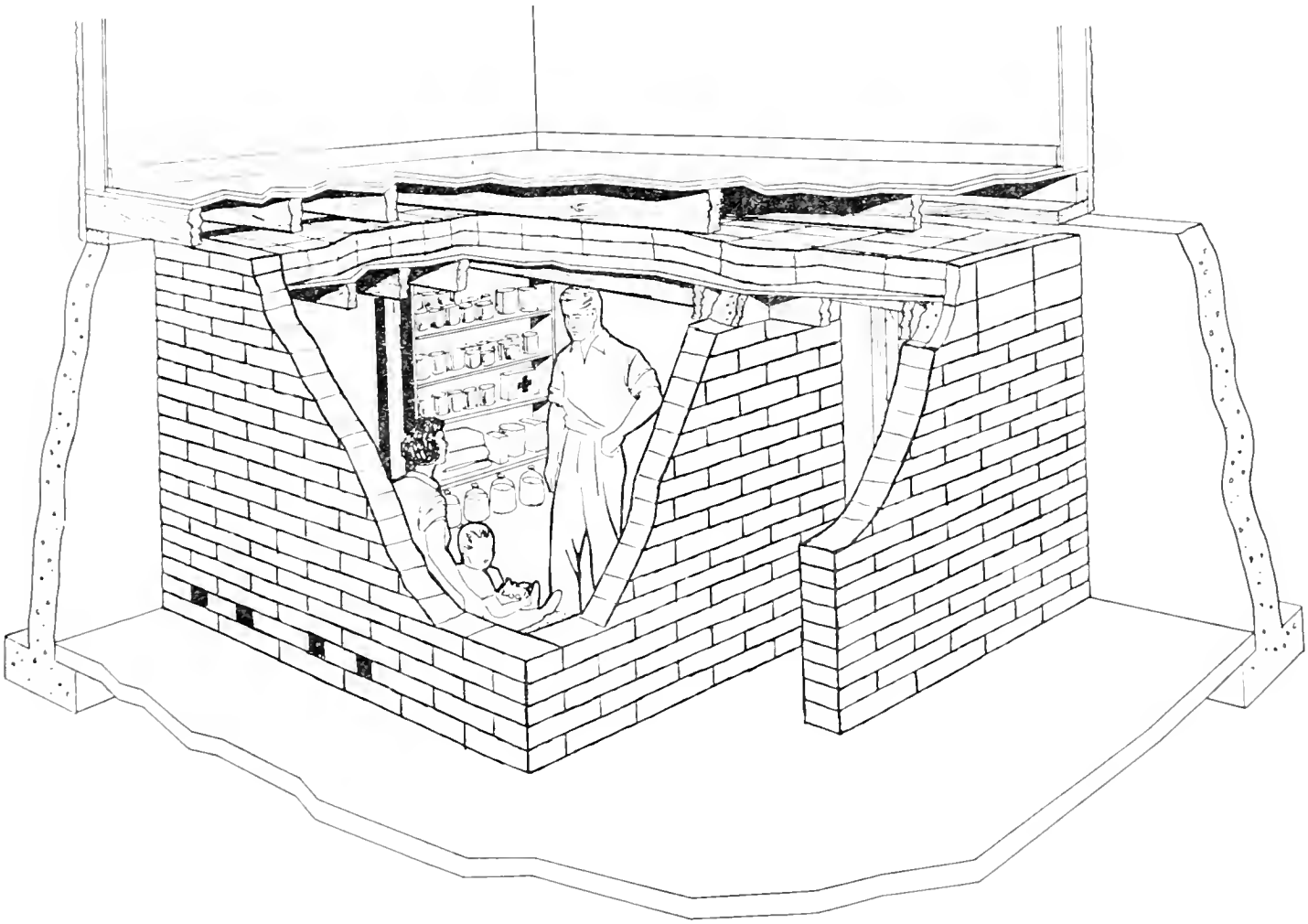


Figure 7—Basement Concrete Block Shelter

Solid concrete blocks, relatively heavy and dense, are used for this shelter. These blocks are sold in various sizes so it seldom is necessary to cut a block to fit.

Solid blocks are recommended because hollow blocks would have to be filled with concrete to give effective protection.

Bricks are an alternative. If they are used, the walls and roof should be 10 inches thick to give the same protection as the 8-inch solid concrete blocks.

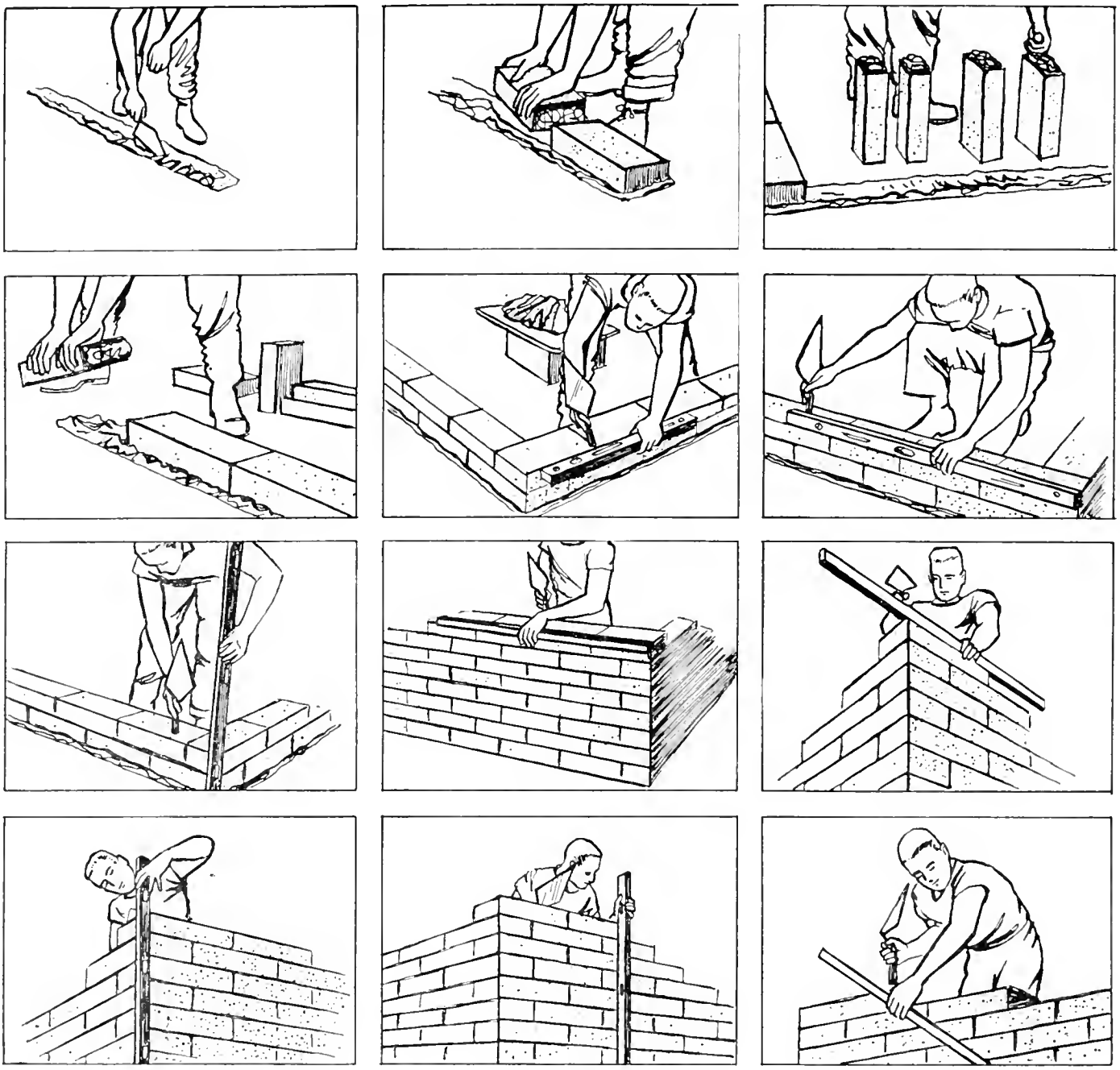


Figure 8

The illustrations in fig. 8 show how to lay a concrete block wall. More detailed instructions may be obtained from your local building supply houses and craftsmen. Other sources of information include the National Concrete Masonry Association, 38 South Dearborn Street, Chicago, Ill., the Portland Cement Association, 33 West Grand Avenue, Chicago, Ill., and the Structural Clay Products Association, Washington, D.C.

ABOVEGROUND DOUBLE-WALL SHELTER

An outdoor, aboveground fallout shelter also may be built with concrete blocks. (See fig. 9, double-wall shelter.) Most people would have to hire a contractor to build this shelter. Plans are on pages 22 and 23.

This shelter could be built in regions where water or rock is close to the surface, making it impractical to build an underground shelter.

Two walls of concrete blocks are constructed at least 20 inches apart. The space between them is filled with pit-run gravel or earth. The walls are held together with metal ties placed in the wet mortar as the walls are built.

The roof shown here (fig. 9) is a 6-inch slab of reinforced concrete, covered with at least 20 inches of pit-run gravel. An alternate roof, perhaps more within do-it-yourself reach, could be constructed of heavy wooden roof beams, overlaid with boards and waterproofing. It would have to be covered with at least 28 inches of pit-run gravel

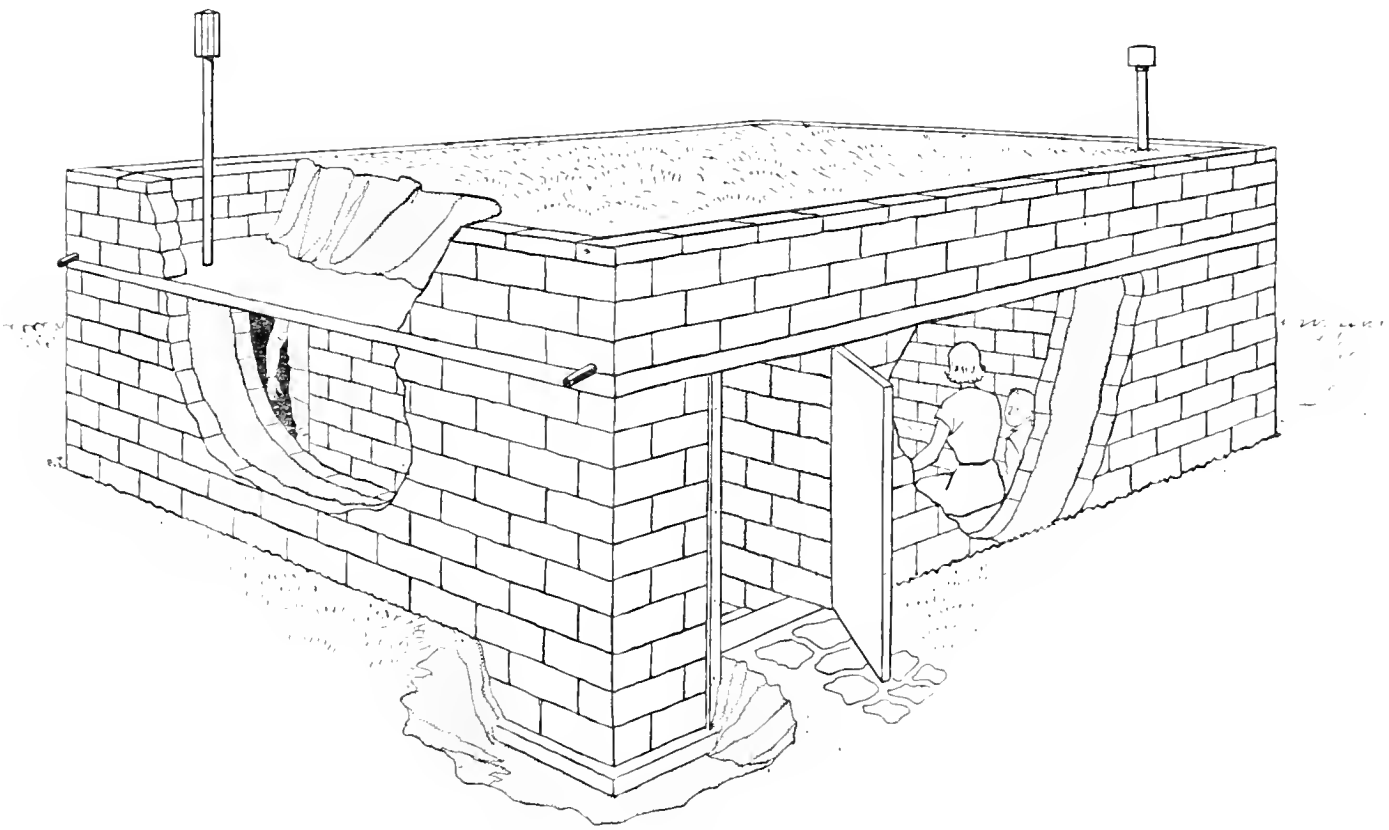


Figure 9.—Aboveground double-wall shelter

The materials for a double-wall shelter would cost about $700. Contractors' charges would be additional. The shelter would provide almost absolute fallout protection.

PRE-SHAPED METAL SHELTER

Pre-shaped corrugated metal sections or pre-cast concrete can be used for shelters either above or below ground. These are particularly suitable for regions where water or rock is close to the surface. They form effective fallout shelters when mounded over with earth, as shown in figure 10.

Materials for this shelter would cost about $700. A contractor probably would be required to help build it. His charges would be added to the cost of materials. This shelter, as shown on page 24, would provide almost absolute protection from fallout radiation. An alternate hatchway entrance, shown on page 25, would reduce the cost of materials $50 to $100.

The National Lumber Manufacturers Association, Washington, D. C., is developing plans to utilize specially treated lumber for underground shelter construction. The Structural Clay Products Institute, Washington, D.C., is working to develop brick and clay products suitable for shelter construction.

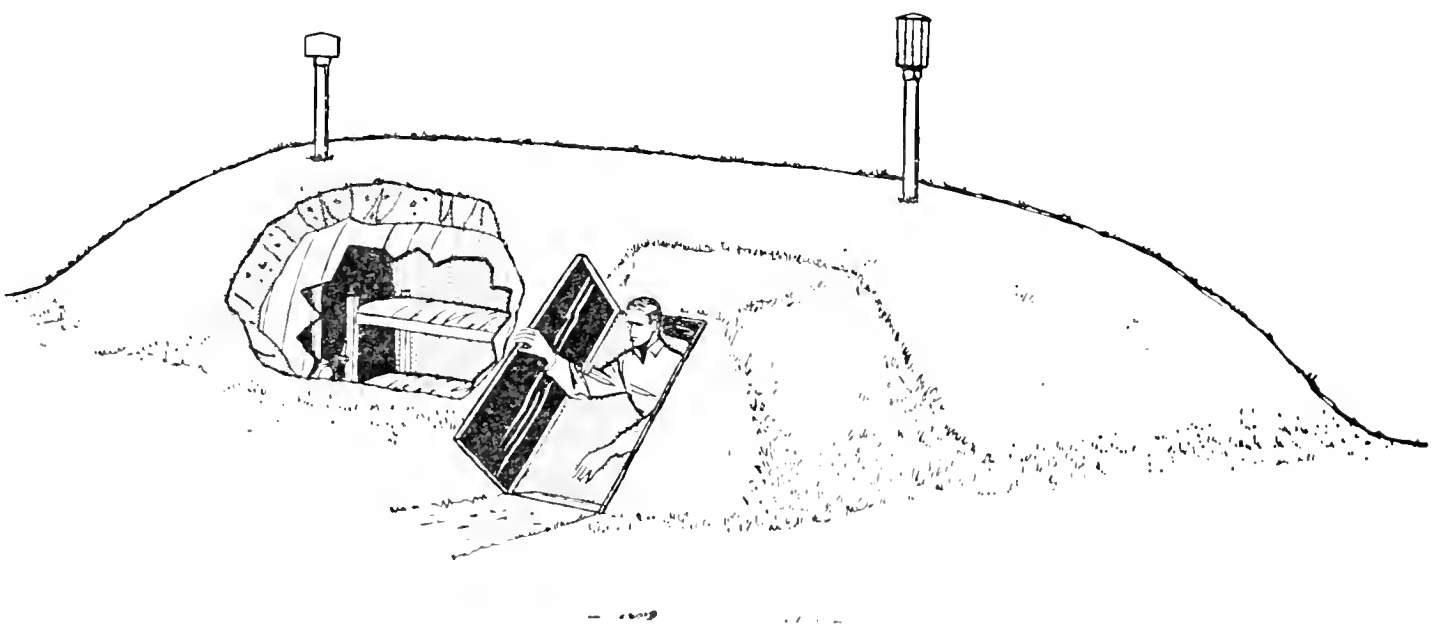


Figure 10.—Pre-shaped metal shelter

UNDERGROUND CONCRETE SHELTER

An underground reinforced concrete shelter can be built by a contractor for about $1,000 to $1,500, depending on the type of entrance. The shelter shown would provide almost absolute fallout protection.

The illustration (fig. 11) shows this shelter with the roof at ground level and mounded over. The same shelter could be built into an embankment or below ground level. Plans for the shelter, with either a stairway or hatchway entrance, are shown on pages 26 and 27.

Another type of shelter which gives excellent fallout protection can be built as an added room to the basement of a home under construction. It would add about $500 to the total cost of the home. The shelter illustrated in figure 12 is based on such a room built in a new home in the Washington, D.C., area in the Spring of 1959.

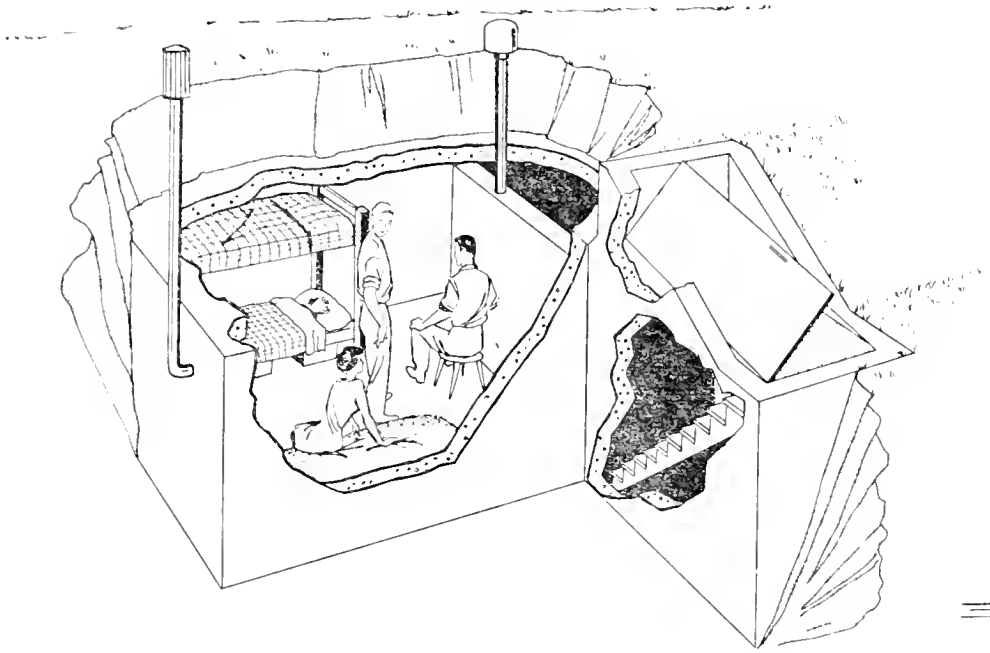


Figure 11.—Underground concrete shelter

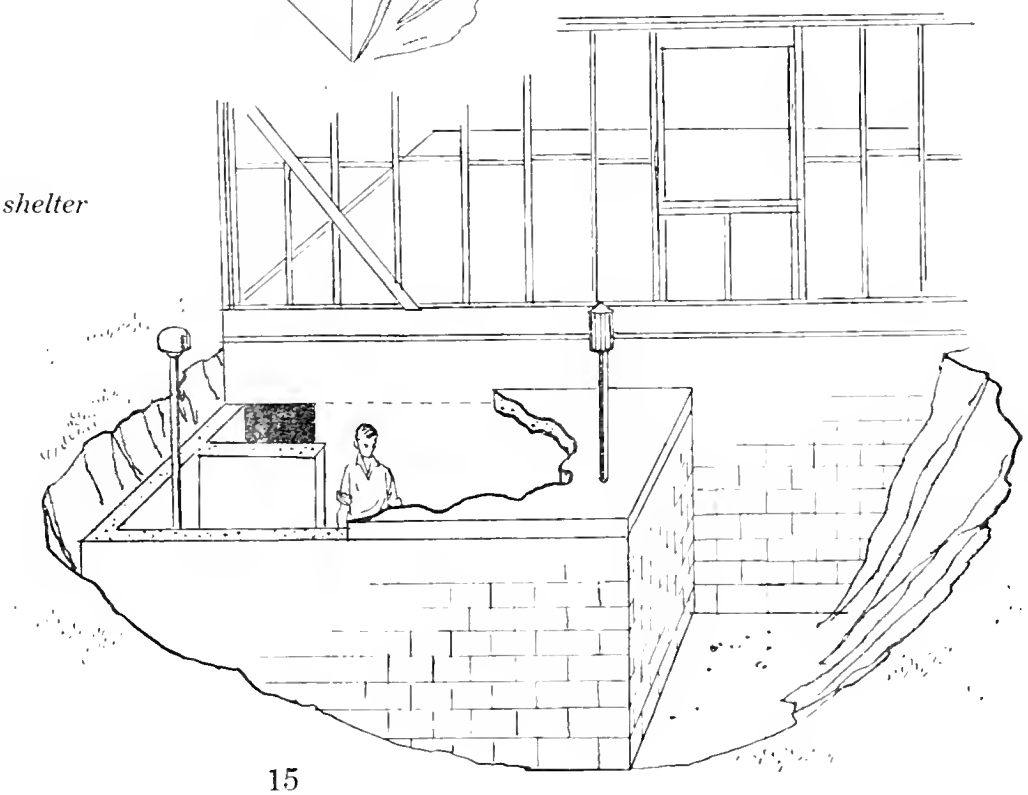
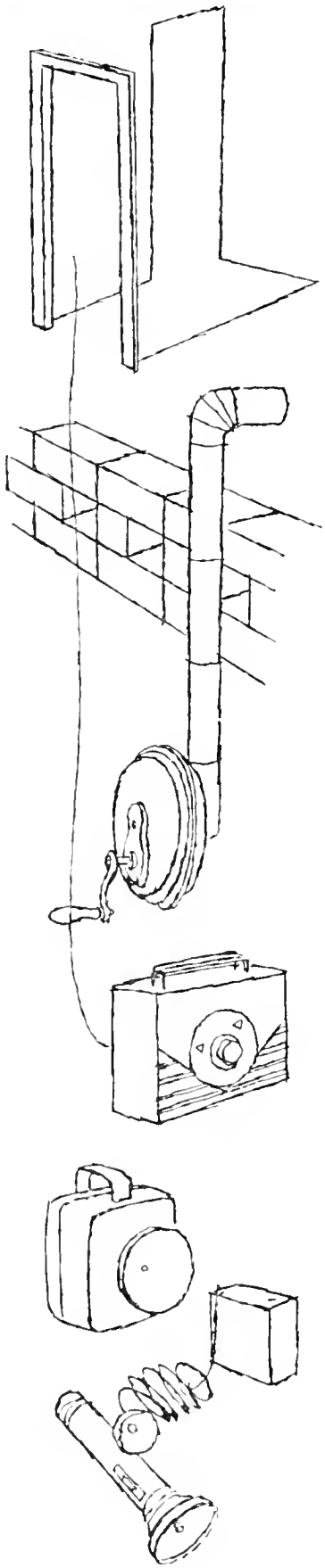


Figure 12.—Concrete basement shelter in new housing



IMPORTANT CONSIDERATIONS common to each type of shelter are:

1. Arrangement of the entrance.
2. Ventilation.
3. Radio reception.
4. Lighting.

THE ENTRANCE must have at least one right-angle turn. Radiation scatters somewhat like light. Some will go around a corner. The rest continues in a straight line. Therefore, sharp turns in a shelter entrance will reduce radiation intensity inside the shelter.

VENTILATION is provided in a concrete block basement shelter by vents in the wall and by the open entrance. A blower may be installed to increase comfort.

A blower is essential for the double-wall shelter and for the underground shelters. It should provide not less than 5 cubic feet per minute of air per person. Vent pipes also are necessary (as shown in figs. 9, 10, and 11), but filters are not.

RADIO RECEPTION is cut down by the shielding necessary to keep out radiation. As soon as the shelter is completed a radio reception check must be made. It probably will be necessary to install an outside antenna, particularly to receive CONELRAD broadcasts.

LIGHTING is an important consideration. Continuous low-level lighting may be provided in the shelter by means of a 4-cell hot-shot battery to which is wired a 150-milliampere flashlight-type bulb. Tests have shown that such a device, with a fresh battery, will furnish light continuously for at least 10 days. With a spare battery, a source of light for 2 weeks or more would be assured. A flashlight or electric lantern also should be available for those periods when a brighter light is needed. There should be a regular electrical outlet in the shelter as power may continue in many areas.

OTHER CONSIDERATIONS.—If there are outside windows in the basement corner where you build a shelter, they should be shielded as shown in the Appendix, page 29. Other basement windows should be blocked when an emergency threatens. Basement walls that project above the ground should be shielded as shown in the Appendix, page 29.

In these shelters the entrance should be not more than 2 feet wide. Bunks, or materials to build them, may have to be put inside the enclosure before the shelter walls are completed.

The basement or belowground shelters also will serve for tornado or hurricane protection.

The radioactivity of fallout decays rapidly at first. *Forty-nine hours after an atomic burst the radiation intensity is only about 1 percent of what it was an hour after the explosion. But the radiation may be so intense at the start that one percent may be extremely dangerous.*

Therefore, civil defense instructions received over CONELRAD or by other means should be followed. A battery-powered radio is essential. When radiation meters suitable for home use are available they will be of value in locating that portion of the home which offers the best protection against fallout radiation. There is a possibility that battery-powered radios with built-in radiation meters may become available. One instrument thus would serve both purposes.

Your local civil defense will gather its own information and will receive broad information from State and Federal sources. It will tell you as soon as possible:

How long to stay in your shelter.

How soon you may go outdoors.

How long you may stay outside.

You should be prepared to stay in your shelter full time for at least several days and to make it your home for 14 days or longer. A checklist in the Appendix, (page 30) tells what is needed. Families with children will have particular problems. They should provide for simple recreation.

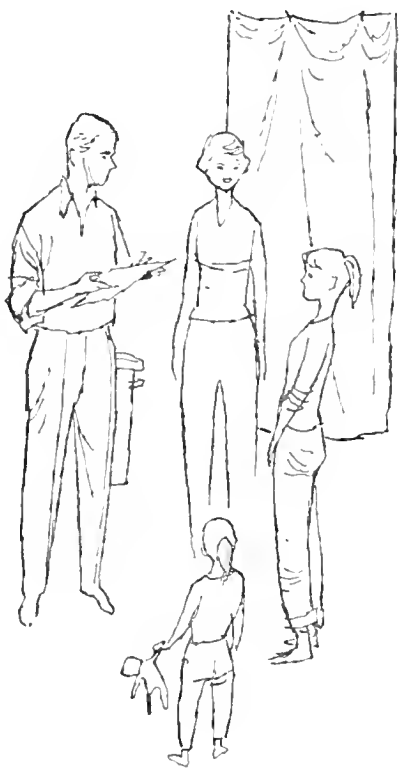
There should be a task for everyone and these tasks should be rotated. Part of the family should be sleeping while the rest is awake.

To break the monotony it may be necessary to invent tasks that will keep the family busy. Records such as diaries can be kept.

The survival of the family will depend largely on information received by radio. A record should be kept of the information and instructions, including the time and date of broadcast.

Family rationing probably will be necessary.

Blowers should be operated periodically on a regular schedule.



There will come a time in a basement shelter when the radiation has decayed enough to allow use of the whole basement. However, as much time as possible should be spent within the shelter to hold radiation exposure to a minimum.

The housekeeping problems of living in a shelter will begin as soon as the shelter is occupied. Food, medical supplies, utensils, and equipment, if not already stored in the shelter, must be quickly gathered up and carried into it.

After the family has settled in the shelter, the housekeeping rules should be spelled out by the adult in charge.

Sanitation in the confines of the family shelter will require much thought and planning.

Provision for emergency toilet facilities and disposal of human wastes will be an unfamiliar problem. A covered container such as a kitchen garbage pail might do as a toilet. A 10-gallon garbage can, with a tightly fitting cover, could be used to keep the wastes until it is safe to leave the shelter.

Water rationing will be difficult and should be planned carefully.

A portable electric heater is advisable for shelters in cold climates. It would take the chill from the shelter in the beginning. Even if the electric power fails after an attack, any time that the heater has been used will make the shelter that much more comfortable. Body heat in the close quarters will help keep up the temperature. Warm clothing and bedding, of course, are essential.

Open-flame heating or cooking should be avoided. A flame would use up air.

Some families already have held weekend rehearsals in their home shelters to learn the problems and to determine for themselves what supplies they would need.

IV. If An Attack Finds You Without A Prepared Shelter

Few areas, if any, are as good as prepared shelters but they are worth knowing about.

A family dwelling without a basement provides some natural shielding from fallout radiation. On the ground floor the radiation would be about half what it is outside. The best protection would be on the ground floor in the central part of the house.

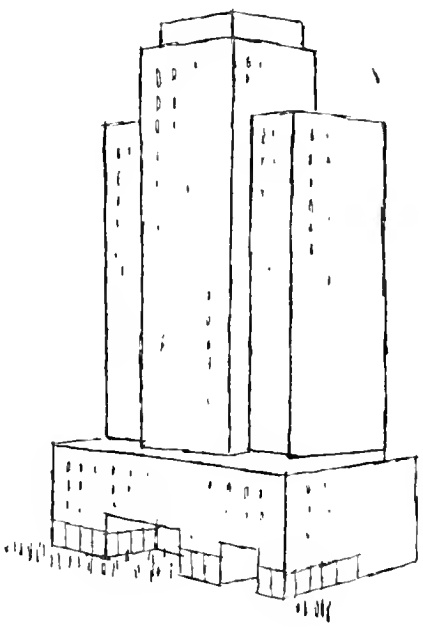
A belowground basement can cut the fallout radiation to one-tenth of the outside level. The safest place is the basement corner least exposed to windows and deepest below ground.

If there is time after the warning, the basement shielding could be improved substantially by blocking windows with bricks, dirt, books, magazines, or other heavy material.

V. Shelter In Apartment Buildings

Large apartment buildings of masonry or concrete provide better natural shelter than the usual family dwellings. In general, such apartments afford more protection than smaller buildings because their walls are thick and there is more space.

The central area of the ground floor of a heavily constructed apartment building, with concrete floors, should provide more fallout protection than the ordinary basement of a family dwelling. The basement of such an apartment building may provide as much natural protection as the specially constructed concrete block shelter recommended for the basement of a family dwelling.



The Federal Government is aiding local governments in several places to survey residential, commercial and industrial buildings to determine what fallout protection they would provide, and for how many people.

The problem for the city apartment dweller is primarily to plan the use of existing space. Such planning will require the cooperation of other occupants and of the apartment management. The space available should be identified and assigned to those who are to use it. The plan will work more smoothly if it is rehearsed. The owner of the building may find it necessary to modify the basement ventilation, water supply, and sanitation system.

You probably would have time to carry your family supplies from your apartment to the basement after an attack warning, before fallout arrives.

VI. Why Prepare A Shelter Now?

Fallout can threaten more people than blast and heat in a nuclear attack.

We do not want a war. We do not know whether there will be a war. But we know that forces hostile to us possess weapons that could destroy us if we were unready. These weapons create a new threat—radioactive fallout that can spread death anywhere.

That is why we must prepare.

No matter where you live a fallout shelter is necessary insurance. It will not be needed except in emergency. But in emergency it will be priceless—as priceless as your life

APPENDIX

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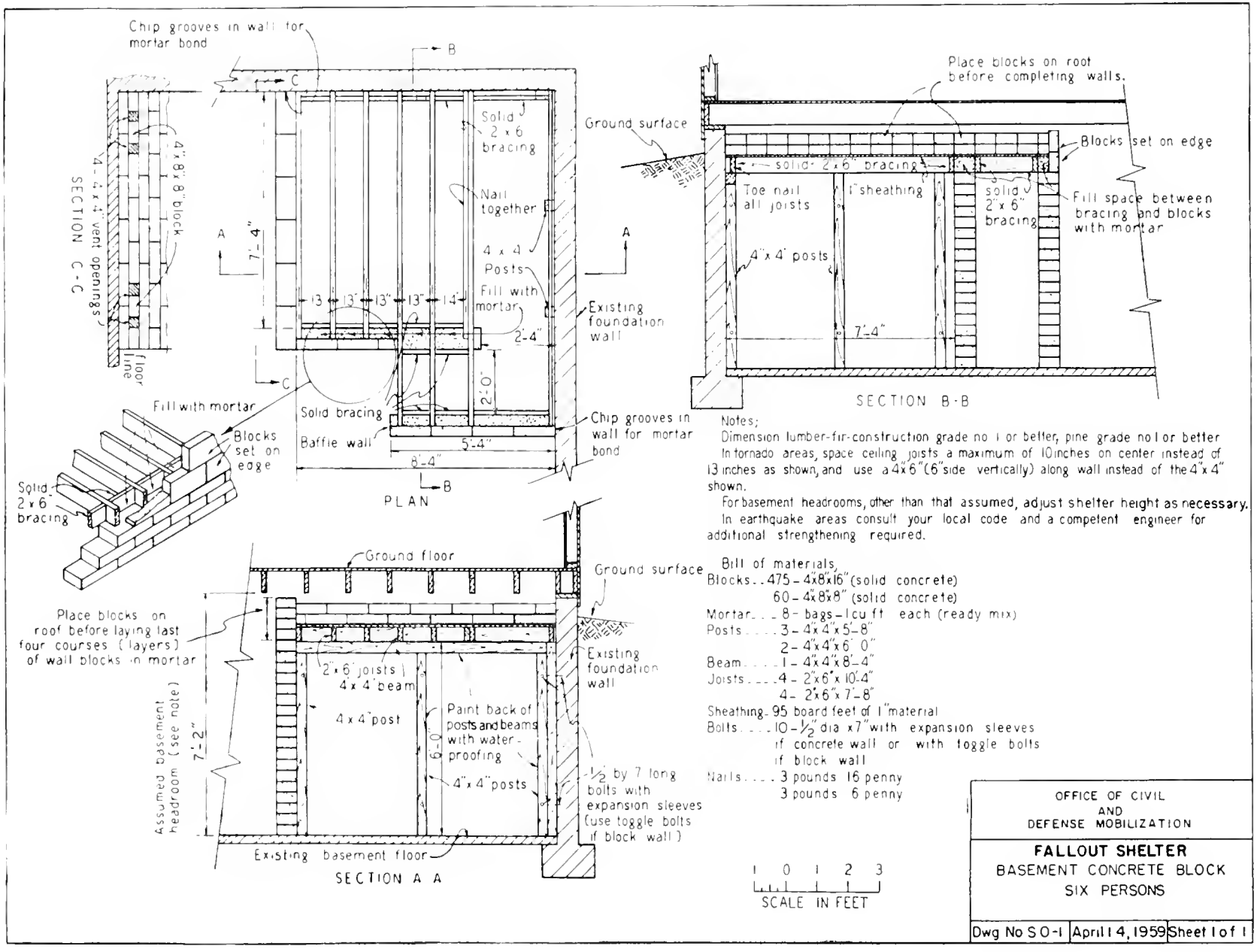
[1] Larger scale drawings may be obtained through your local civil defense organization, or from OCDM, Battle Creek, Mich.



Notes;

Dimension lumber-fir-construction grade no 1 or better, pine grade no 1 or better

In tornado areas, space ceiling joists a maximum of 10 inches on center instead of 13 inches as shown, and use a 4"x 6" (6" side vertically) along wall instead of the 4"x 4" shown.

For basement headrooms, other than that assumed, adjust shelter height as necessary.

In earthquake areas consult your local code and a competent engineer for additional strengthening required.

Bill of materials,

Blocks	475 - 4"x8"x16" (solid concrete)
	60 - 4"x8"x8" (solid concrete)
Mortar	8 - bags - 1 cu ft each (ready mix)
Posts	3 - 4"x4"x5'-8"
	2 - 4"x4"x6' 0"
Beam	1 - 4"x4"x8'-4"
Joists	4 - 2"x6"x 10'-4"
	4 - 2"x6"x 7'-8"
Sheathing	95 board feet of 1" material
Bolts	10 - 1/2" dia x7" with expansion sleeves if concrete wall or with toggle bolts if block wall
Nails	3 pounds 16 penny
	3 pounds 6 penny

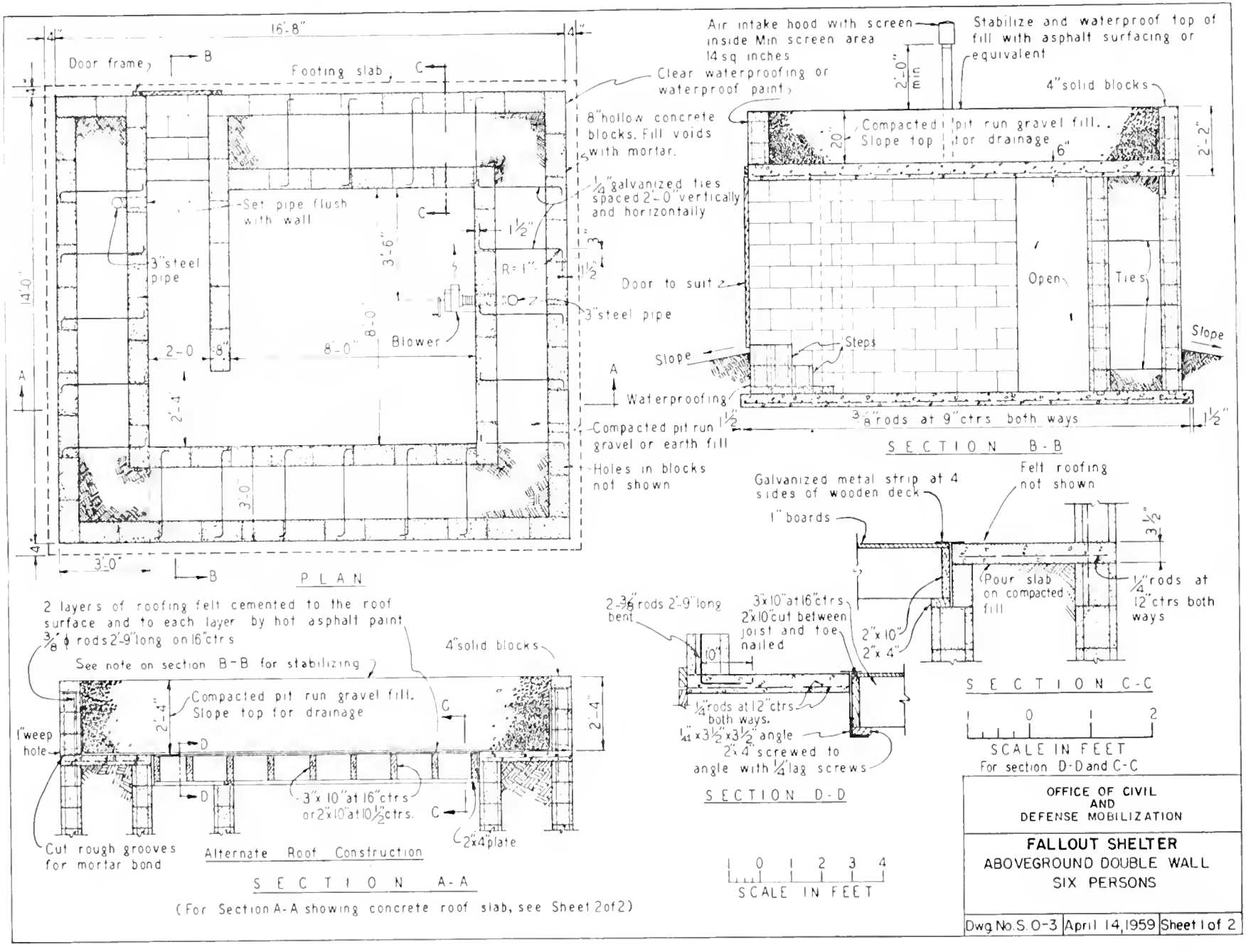
1 0 1 2 3
SCALE IN FEET

OFFICE OF CIVIL AND DEFENSE MOBILIZATION

FALLOUT SHELTER
BASEMENT CONCRETE BLOCK
SIX PERSONS

Dwg No S O-1 | April 14, 1959 | Sheet 1 of 1

Figure 13


16'-8"
Door frame
Footing slab
Set pipe flush with wall
3"steel pipe
Blower
14'-0"
8'-0"
2'-4"
3'-0"
PLAN
Air intake hood with screen inside Min screen area 14 sq inches
Clear waterproofing or waterproof paint
8"hollow concrete blocks. Fill voids with mortar.
1/4"galvanized ties spaced 2'-0" vertically and horizontally
Door to suit
Compacted pit run gravel or earth fill
Holes in blocks not shown
Stabilize and waterproof top of fill with asphalt surfacing or equivalent
4"solid blocks
Compacted pit run gravel fill. Slope top for drainage
Open
Ties
Steps
Slope
Waterproofing
3/8"rods at 9"ctrs both ways
SECTION B-B
Galvanized metal strip at 4 sides of wooden deck
Felt roofing not shown
1" boards
(Pour slab on compacted fill
1/4"rods at 12"ctrs both ways
SECTION C-C
SCALE IN FEET
For section D-D and C-C
2 layers of roofing felt cemented to the roof surface and to each layer by hot asphalt paint
3/8"ϕ rods 2'-9" long on 16"ctrs
See note on section B-B for stabilizing
Compacted pit run gravel fill. Slope top for drainage
1"weep hole
Cut rough grooves for mortar bond
3"x 10" at 16"ctrs or 2"x10" at 10 1/2"ctrs.
2"x4"plate
Alternate Roof Construction
SECTION A-A
2-3/8"rods 2'-9" long bent
3"x10" at 16"ctrs
2"x10" cut between joist and toe nailed
2"x10"
2"x 4"
1/4"rods at 12"ctrs both ways.
1 1/4"x3 1/2"x3 1/2" angle
2"x4" screwed to angle with 1/4" lag screws
SECTION D-D
SCALE IN FEET
OFFICE OF CIVIL AND DEFENSE MOBILIZATION
FALLOUT SHELTER
ABOVEGROUND DOUBLE WALL
SIX PERSONS
Dwg. No. S. O-3
April 14, 1959
Sheet 1 of 2

(For Section A-A showing concrete roof slab, see Sheet 2 of 2)

Figure 14

Notes,

16-4"x8"x16" and 16-4"x8"x8" solid blocks must be provided for 8" thick wall to be laid up without mortar across the doorway after shelter is occupied

Solid concrete blocks or brick may be used

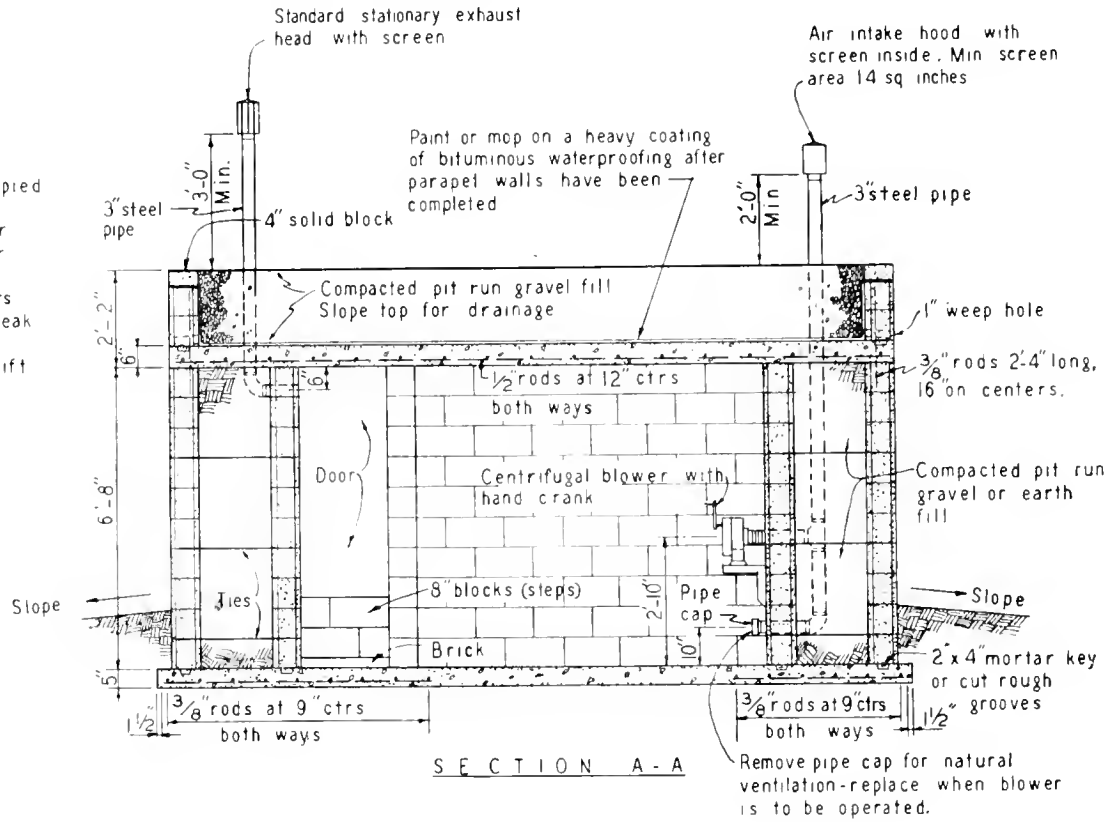
If brick is used for walls fill must be 6" thicker

Build walls in 2'-0" lifts (heights) or less Let mortar harden for each lift

Then compact the earth fill thoroughly in 4" layers Compaction to be done carefully so as not to break the mortar bond

Protect the compacted soil from water for each lift

Gravel may be compacted in 8" layers



0 1 2 3 4

SCALE IN FEET

OFFICE OF CIVIL AND DEFENSE MOBILIZATION

FALLOUT SHELTER

ABOVEGROUND DOUBLE WALL

SIX PERSONS

Dwg No. S-0-3	April 14, 1959	Sheet 2 of 2

Figure 15

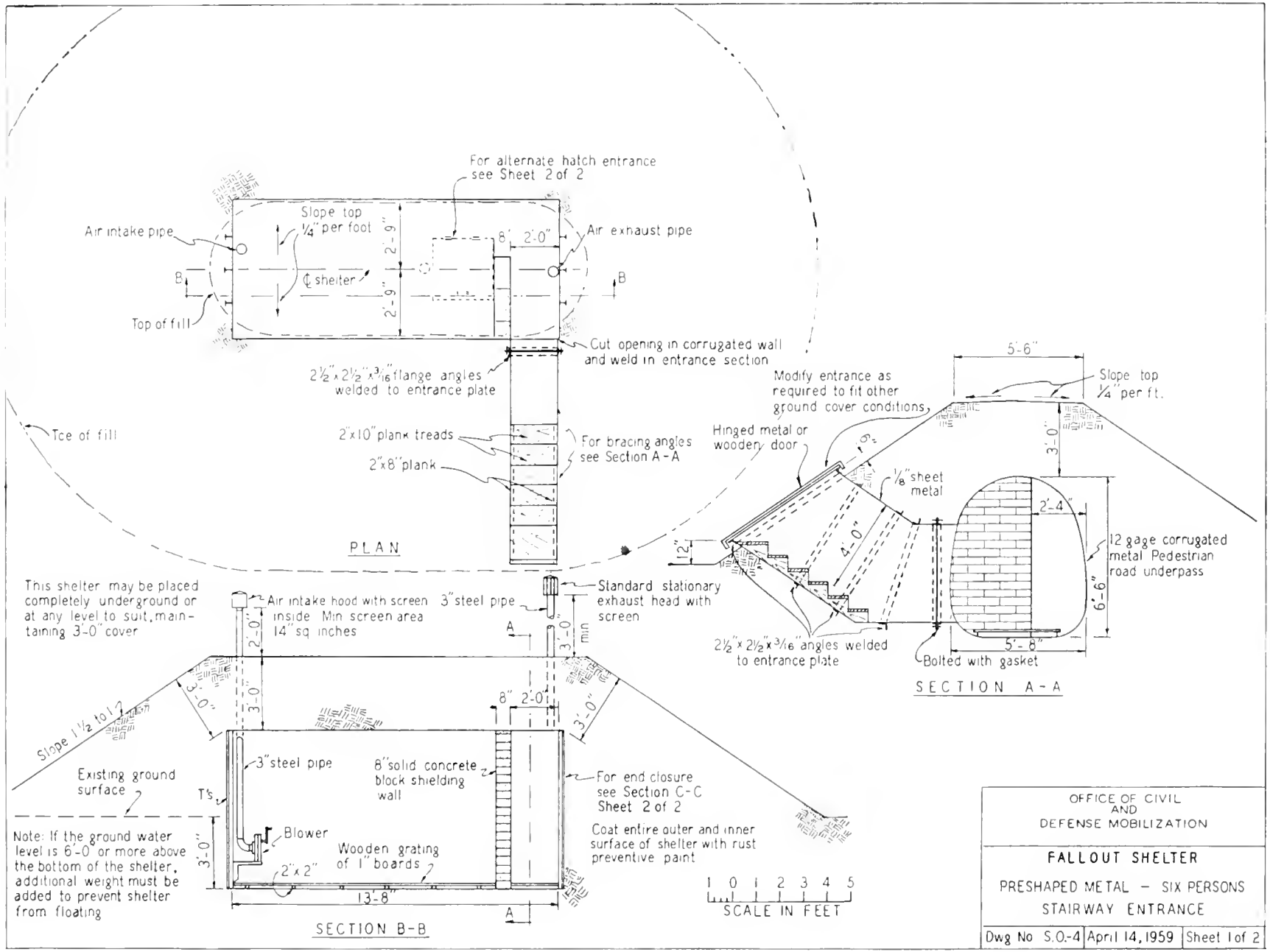

For alternate hatch entrance see Sheet 2 of 2
Slope top 1/4" per foot
Air intake pipe
Air exhaust pipe
℄ shelter
Top of fill
Cut opening in corrugated wall and weld in entrance section
2½"x2½"x3/16" flange angles welded to entrance plate
Toe of fill
2"x10" plank treads
2"x8" plank
For bracing angles see Section A-A
PLAN
Modify entrance as required to fit other ground cover conditions
Hinged metal or wooden door
1/8" sheet metal
Slope top 1/4" per ft.
12 gage corrugated metal Pedestrian road underpass
2½"x2½"x3/16" angles welded to entrance plate
Bolted with gasket
SECTION A-A
This shelter may be placed completely underground or at any level to suit, maintaining 3'-0" cover
Air intake hood with screen inside Min screen area 14" sq inches
3" steel pipe
Standard stationary exhaust head with screen
Slope 1½ to 1
Existing ground surface
3" steel pipe
8" solid concrete block shielding wall
For end closure see Section C-C Sheet 2 of 2
T's
Blower
Wooden grating of 1" boards
2"x2"
Coat entire outer and inner surface of shelter with rust preventive paint
Note: If the ground water level is 6'-0" or more above the bottom of the shelter, additional weight must be added to prevent shelter from floating
SECTION B-B
SCALE IN FEET
OFFICE OF CIVIL AND DEFENSE MOBILIZATION
FALLOUT SHELTER
PRESHAPED METAL – SIX PERSONS
STAIRWAY ENTRANCE
Dwg No S.O.-4
April 14, 1959
Sheet 1 of 2

Figure 16

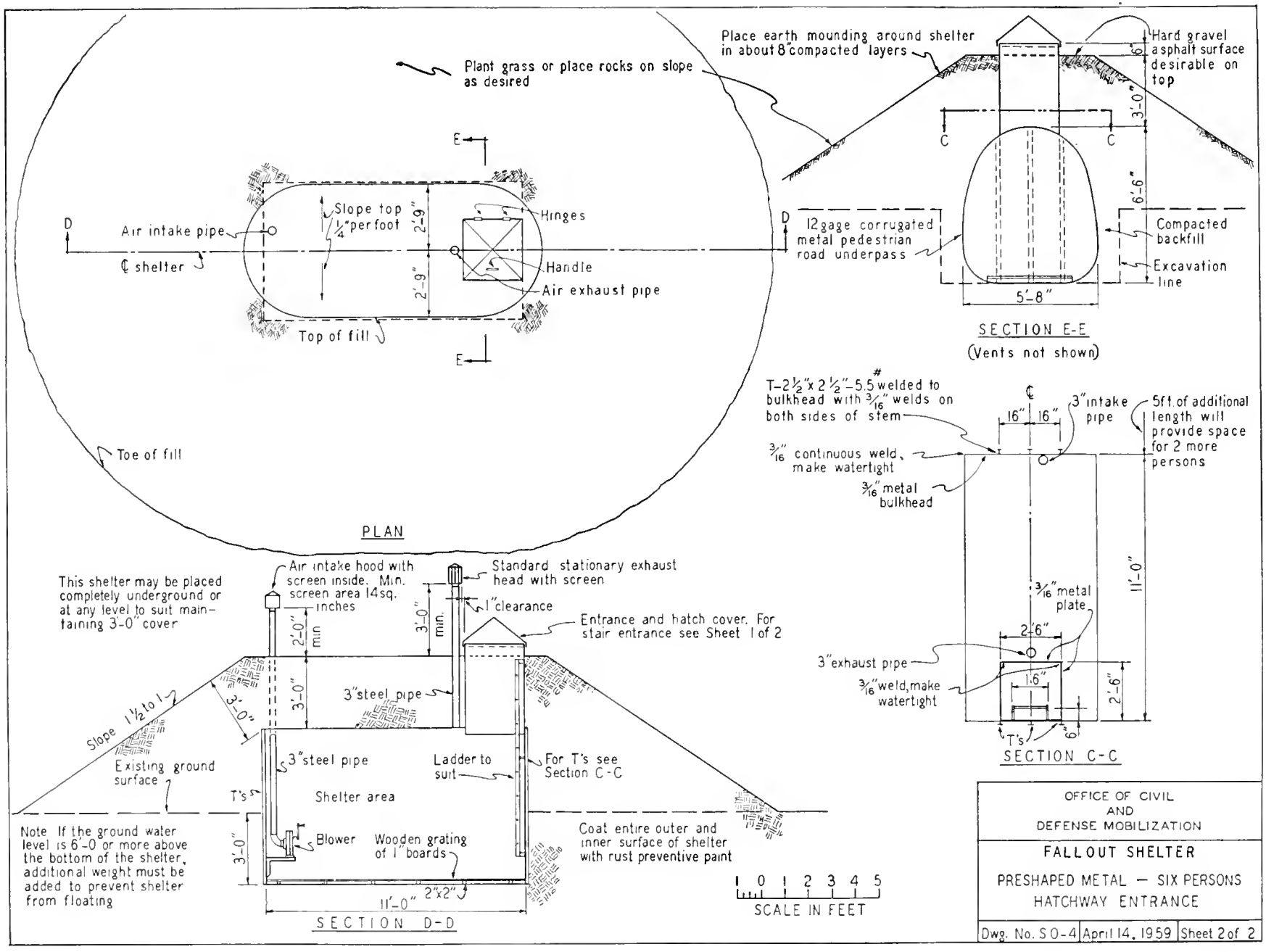

Plant grass or place rocks on slope as desired
Place earth mounding around shelter in about 8" compacted layers
Hard gravel asphalt surface desirable on top
Air intake pipe
℄ shelter
Slope top ¼" per foot
2'-9"
Hinges
Handle
Air exhaust pipe
Top of fill
Toe of fill
PLAN
12 gage corrugated metal pedestrian road underpass
Compacted backfill
Excavation line
5'-8"
SECTION E-E
(Vents not shown)
T-2½"x 2½"-5.5# welded to bulkhead with 3/16" welds on both sides of stem
3/16" continuous weld, make watertight
3/16" metal bulkhead
3" intake pipe
5ft. of additional length will provide space for 2 more persons
3/16" metal plate
2'-6"
3" exhaust pipe
3/16" weld, make watertight
1.6"
T's
SECTION C-C
This shelter may be placed completely underground or at any level to suit maintaining 3'-0" cover
Air intake hood with screen inside. Min. screen area 14 sq. inches
Standard stationary exhaust head with screen
1" clearance
Entrance and hatch cover. For stair entrance see Sheet 1 of 2
2'-0" min
3'-0" min.
3'-0"
3" steel pipe
Slope 1½ to 1
Existing ground surface
Ladder to suit
For T's see Section C-C
Shelter area
Blower
Wooden grating of 1" boards
2"x2"
11'-0"
SECTION D-D
Note If the ground water level is 6'-0 or more above the bottom of the shelter, additional weight must be added to prevent shelter from floating
Coat entire outer and inner surface of shelter with rust preventive paint
0 1 2 3 4 5
SCALE IN FEET
OFFICE OF CIVIL AND DEFENSE MOBILIZATION
FALLOUT SHELTER
PRESHAPED METAL — SIX PERSONS
HATCHWAY ENTRANCE
Dwg. No. S 0-4
April 14, 1959
Sheet 2 of 2

Figure 17

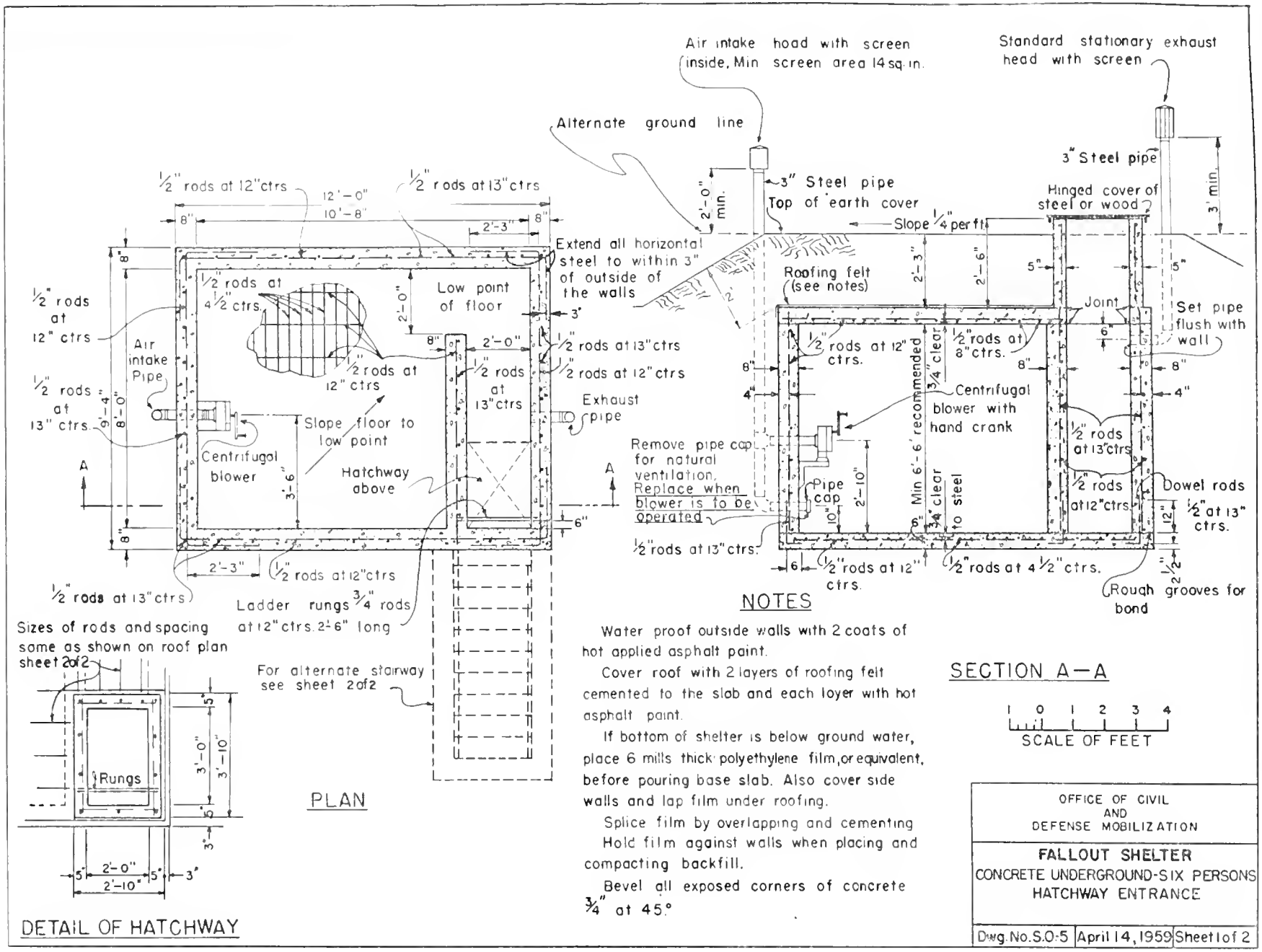
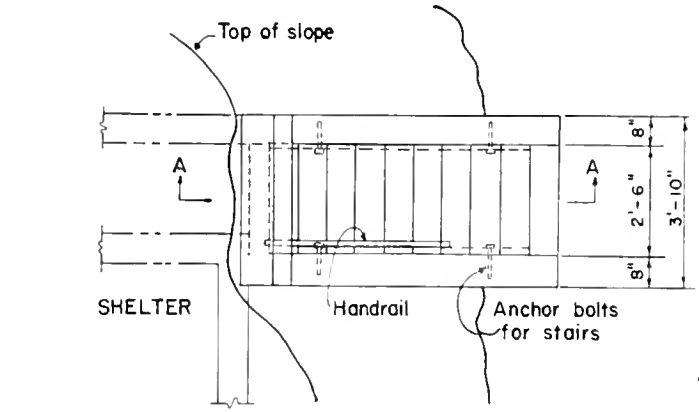
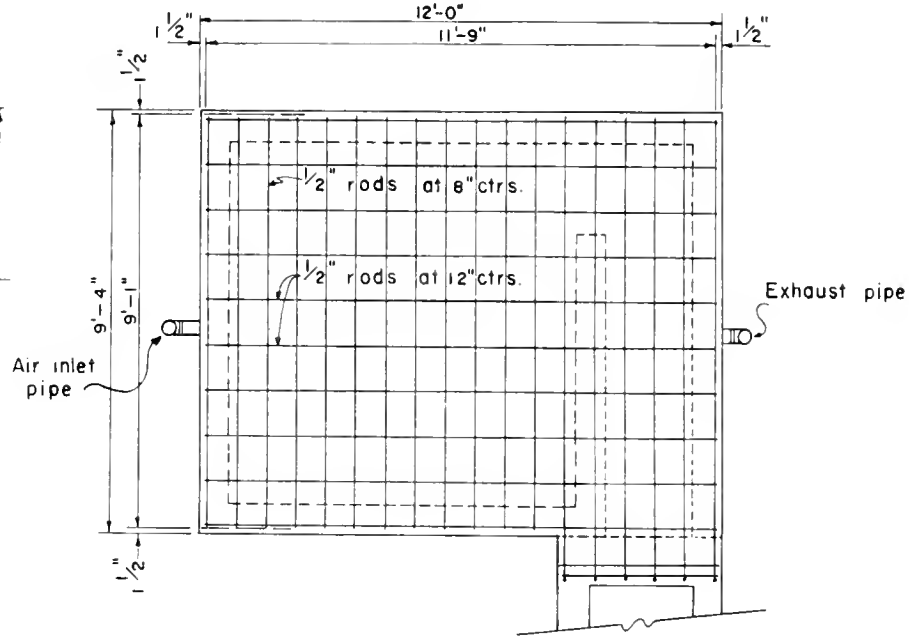

Air intake hood with screen inside, Min screen area 14 sq. in.
Standard stationary exhaust head with screen
Alternate ground line
3" Steel pipe
Top of earth cover
Hinged cover of steel or wood
Slope 1/4" per ft
Roofing felt (see notes)
Joint
Set pipe flush with wall
Extend all horizontal steel to within 3" of outside of the walls
Low point of floor
Air intake Pipe
Exhaust pipe
Centrifugal blower
Slope floor to low point
Hatchway above
Centrifugal blower with hand crank
Remove pipe cap for natural ventilation. Replace when blower is to be operated
Pipe cap
Dowel rods 1/2" at 13" ctrs.
Rough grooves for bond
Ladder rungs 3/4" rods at 12" ctrs. 2'-6" long
For alternate stairway see sheet 2 of 2
Sizes of rods and spacing same as shown on roof plan sheet 2 of 2
Rungs
PLAN
DETAIL OF HATCHWAY
SECTION A—A
SCALE OF FEET
NOTES
Water proof outside walls with 2 coats of hot applied asphalt paint.
Cover roof with 2 layers of roofing felt cemented to the slab and each layer with hot asphalt paint.
If bottom of shelter is below ground water, place 6 mills thick polyethylene film, or equivalent, before pouring base slab. Also cover side walls and lap film under roofing.
Splice film by overlapping and cementing
Hold film against walls when placing and compacting backfill.
Bevel all exposed corners of concrete 3/4" at 45°
OFFICE OF CIVIL AND DEFENSE MOBILIZATION
FALLOUT SHELTER
CONCRETE UNDERGROUND-SIX PERSONS
HATCHWAY ENTRANCE
Dwg. No. S.O-5
April 14, 1959
Sheet 1 of 2

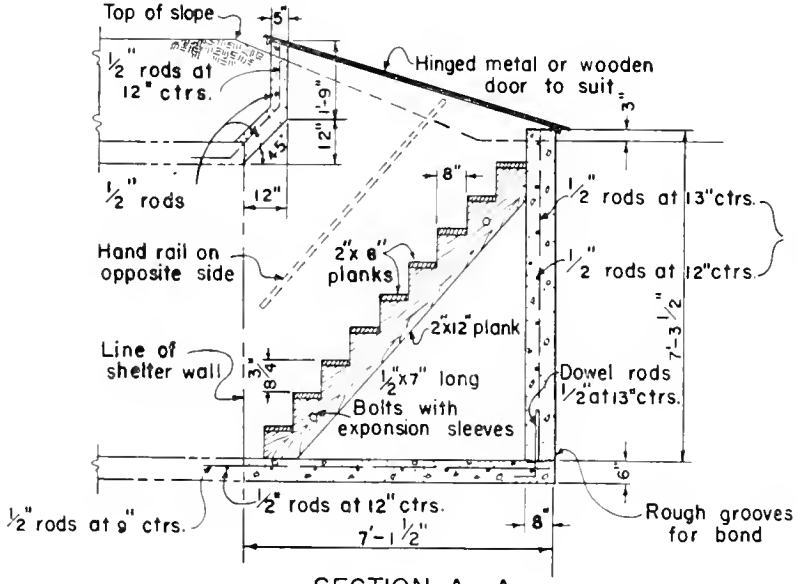
Figure 18



PLAN
(Door Removed)



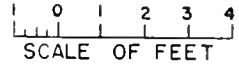
ROOF PLAN SHOWING REINFORCING



SECTION A-A

ALTERNATE STAIRWAY DETAILS

FOR NOTES
SEE, SHEET 1 of 2



OFFICE OF CIVIL AND DEFENSE MOBILIZATION		
FALLOUT SHELTER CONCRETE UNDERGROUND-SIX PERSONS STAIRWAY ENTRANCE		
Dwg. No. S.O-5	April 14, 1959	Sheet 2 of 2

Figure 19

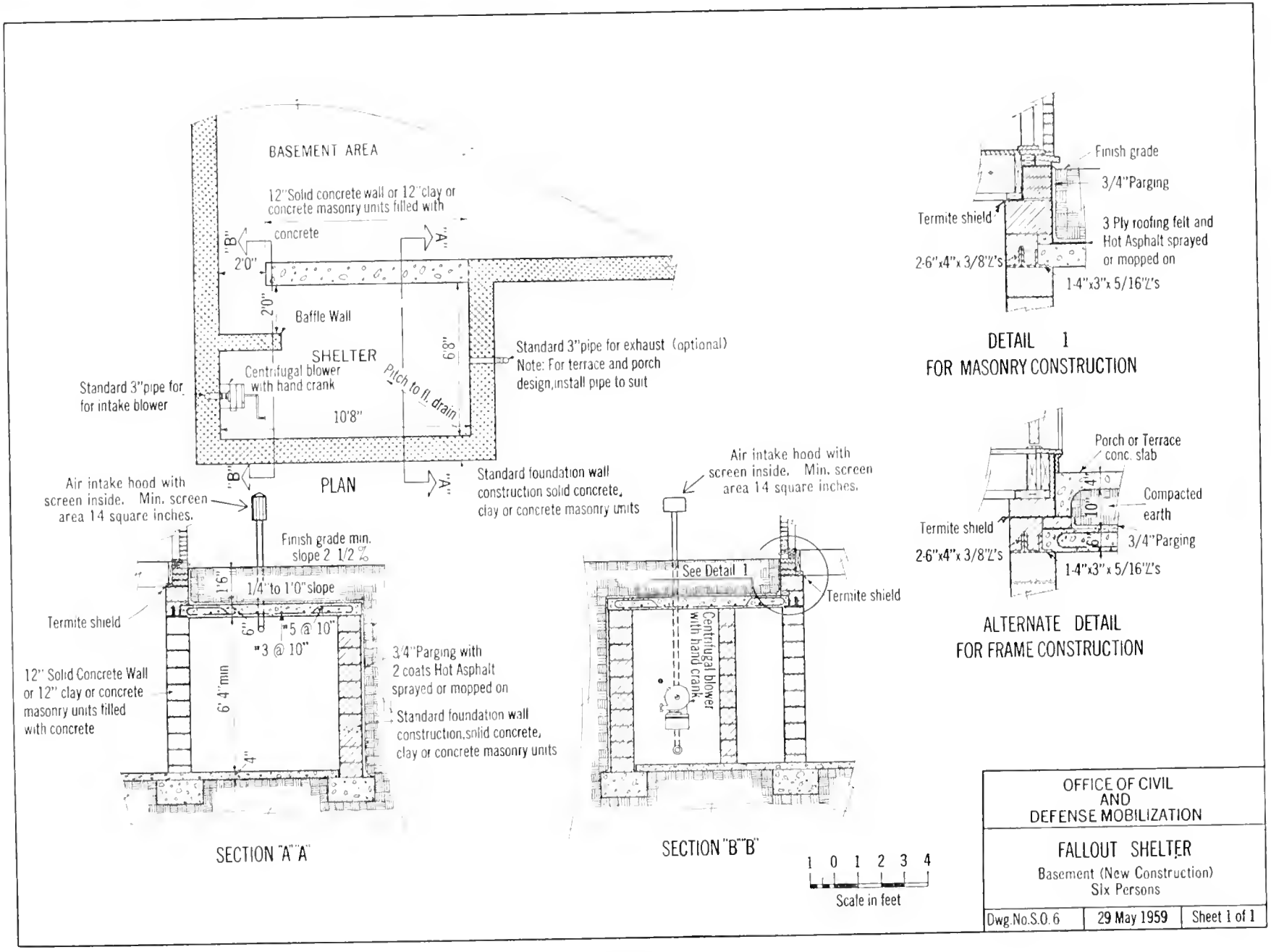

BASEMENT AREA
12"Solid concrete wall or 12"clay or concrete masonry units filled with concrete
"B"
"A"
2'0"
2'0"
Baffle Wall
SHELTER
Centrifugal blower with hand crank
8'9"
10'8"
Pitch to fl. drain
Standard 3"pipe for for intake blower
Standard 3"pipe for exhaust (optional)
Note: For terrace and porch design,install pipe to suit
PLAN
Air intake hood with screen inside. Min. screen area 14 square inches.
Standard foundation wall construction solid concrete, clay or concrete masonry units
Finish grade min. slope 2 1/2 %
1'6"
1/4" to 1'0" slope
Termite shield
6"
#5 @ 10"
#3 @ 10"
12" Solid Concrete Wall or 12" clay or concrete masonry units filled with concrete
6' 4" min
4"
3/4"Parging with 2 coats Hot Asphalt sprayed or mopped on
Standard foundation wall construction,solid concrete, clay or concrete masonry units
SECTION "A"-"A"
Air intake hood with screen inside. Min. screen area 14 square inches.
See Detail 1
Termite shield
Centrifugal blower with hand crank
SECTION "B"-"B"
1 0 1 2 3 4
Scale in feet
Finish grade
3/4"Parging
Termite shield
3 Ply roofing felt and Hot Asphalt sprayed or mopped on
2-6"x4"x 3/8"Z's
1-4"x3"x 5/16"Z's
DETAIL 1
FOR MASONRY CONSTRUCTION
Porch or Terrace conc. slab
4"
10"
Compacted earth
Termite shield
3/4"Parging
2-6"x4"x 3/8"Z's
1-4"x3"x 5/16"Z's
ALTERNATE DETAIL
FOR FRAME CONSTRUCTION
OFFICE OF CIVIL AND DEFENSE MOBILIZATION
FALLOUT SHELTER
Basement (New Construction)
Six Persons
Dwg.No.S.O. 6
29 May 1959
Sheet 1 of 1

Figure 20

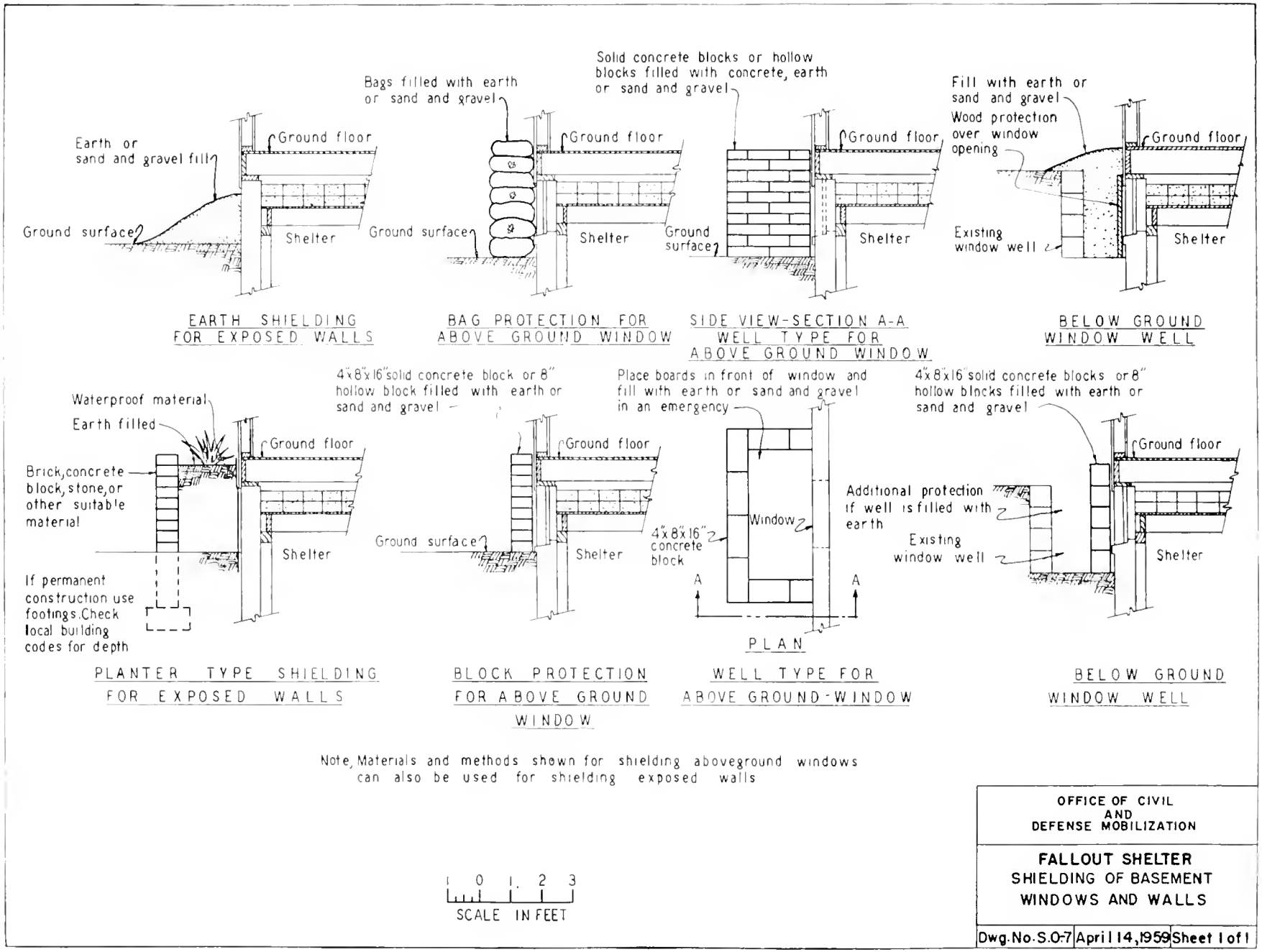
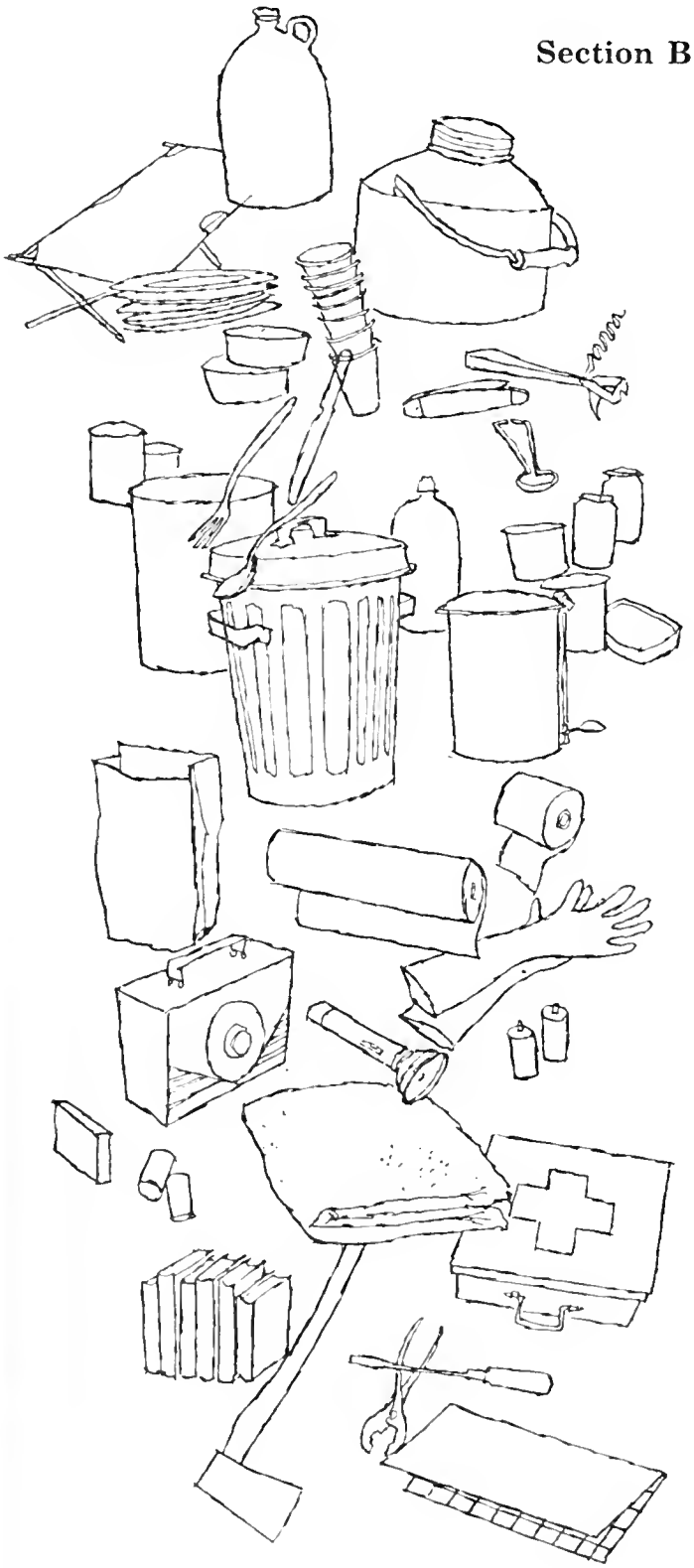

Earth or
sand and gravel fill
Ground floor
Ground surface
Shelter
EARTH SHIELDING
FOR EXPOSED WALLS
Bags filled with earth
or sand and gravel
Ground floor
Ground surface
Shelter
BAG PROTECTION FOR
ABOVE GROUND WINDOW
Solid concrete blocks or hollow
blocks filled with concrete, earth
or sand and gravel
Ground floor
Ground surface
Shelter
SIDE VIEW-SECTION A-A
WELL TYPE FOR
ABOVE GROUND WINDOW
Fill with earth or
sand and gravel
Wood protection
over window
opening
Ground floor
Existing
window well
Shelter
BELOW GROUND
WINDOW WELL
Waterproof material
Earth filled
Brick, concrete
block, stone, or
other suitable
material
Ground floor
Shelter
If permanent
construction use
footings. Check
local building
codes for depth
PLANTER TYPE SHIELDING
FOR EXPOSED WALLS
4"x8"x16" solid concrete block or 8"
hollow block filled with earth or
sand and gravel
Ground floor
Ground surface
Shelter
BLOCK PROTECTION
FOR ABOVE GROUND
WINDOW
Place boards in front of window and
fill with earth or sand and gravel
in an emergency
Window
4"x8"x16"
concrete
block
A
A
PLAN
WELL TYPE FOR
ABOVE GROUND-WINDOW
4"x8"x16" solid concrete blocks or 8"
hollow blocks filled with earth or
sand and gravel
Ground floor
Additional protection
if well is filled with
earth
Existing
window well
Shelter
BELOW GROUND
WINDOW WELL
Note, Materials and methods shown for shielding aboveground windows
can also be used for shielding exposed walls
0 1 2 3
SCALE IN FEET
OFFICE OF CIVIL
AND
DEFENSE MOBILIZATION
FALLOUT SHELTER
SHIELDING OF BASEMENT
WINDOWS AND WALLS
Dwg. No. S.O-7
April 14, 1959
Sheet 1 of 1

Figure 21



Section B

SHELTER CHECKLIST

Food and cooking equipment:

- Water (2-week supply, a minimum of 7 gal. per person)
- Food (2-week supply)
- Eating utensils
- Paper plates, cups, and napkins (2-week supply)
- Openers for cans and bottles
- Pocket knife
- Special foods for babies and the sick

Supplies and equipment for sanitation:

- Can for garbage (20-gal.)
- Covered pail for toilet purposes
- Can for human wastes (10-gal.)
- Toilet tissue, paper towels, sanitary napkins, disposable diapers, ordinary and waterless soap
- Grocery bags, newspapers for soil bags
- Household chlorine (2 pt.) and DDT (1 qt. of 5% solution)
- Waterproof gloves

Shelter equipment:

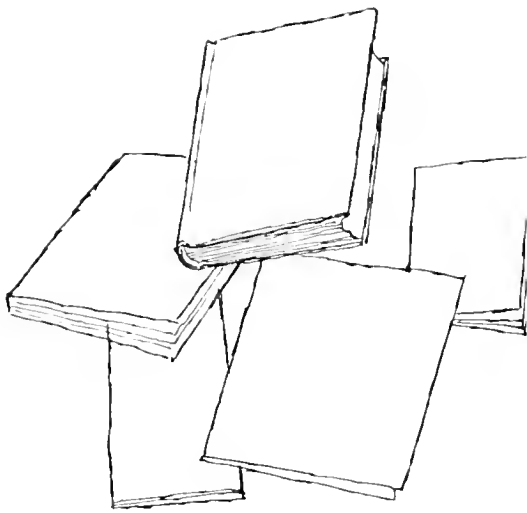
- Battery radio with CONELRAD frequencies (640 or 1240) marked, and spare batteries for 2-week operation
- Home use radiation meters, when available
- Flashlights, electric lantern, and spare batteries for 2 weeks
- Clothing
- Bedding (rubber sheeting and special equipment for the sick)
- A first-aid kit and supplies listed in OCDM Leaflet L-2-12, *First Aid: Emergency Kit; Emergency Action*
- Writing material
- Reading material
- Screwdriver, pliers, and other household tools
- Games and amusements for children

Items outside the shelter but within reach:

- Cooking equipment (canned heat, or camp stove) and matches
- Home fire-fighting equipment
- Rescue tools

Medical Publications:

Any one of the following publications from a list provided by the Bureau of Health Education of the American Medical Association would be helpful when a physician is not available.



What To Do Until the Doctor Comes, William Bolton, M.D., 145 pp. Cloth, $2. Reilly & Lee Co., 325 West Huron St., Chicago, Ill.

Book of Health: "A Medical Encyclopedia for Everyone," Randolph Lee Clark, M.D., 768 pp., 1,400 illustrations. Cloth, $10. Elsevier Press, Inc., 402 Lovett Boulevard, Houston 6, Texas.

Ship's Medicine Chest and First Aid at Sea. U.S. Public Health Service and War Shipping Administration, 498 pp., illustrated, $3.50. U.S. Government Printing Office, Superintendent of Documents, Washington 25, D.C.

SUGGESTIONS FOR CONTRACTS

Section C

Following is a quick checklist of items to discuss with contractor during negotiations:

1. Drainage from area around underground or outdo shelters.
2. Protection against cave-in excavations.
3. Concrete strength and reinforcement.
4. Waterproofing.
5. Doors or hatches.
6. Ventilation.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF CIVIL AND DEFENSE MOBILIZATION
BATTLE CREEK, MICHIGAN

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, $300